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THE TRAINING OF MEDICAL STUDENTS IN OBSTETRICS

CLINICAL TEACHING AND PRACTICAL EXPERIENCE AS ESSENTIALS

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"Ideally, all women should have the protection of delivery in hospitals under supervision of men trained in gynecology and obstetrics." The foregoing statement is one of the conclusions reached by Aldridge in an analysis of the end results of labor in 2,800 primiparas at the Woman's Hospital of New York, where he found that less damage resulted from so-called prophylactic methods, including outlet or low forceps with episiotomy, than with spontaneous deliveries. However, he is careful to limit his belief in the efficacy of such procedures to men adequately trained and to hospitals adequately equipped. It is doubtful whether there are enough institutional beds available even in large centers to provide the satisfactory outcome hoped for by Aldridge and thus it becomes necessary to balance the results obtained in such ideal hospitals with those of the home and of hospitals less adequately staffed and equipped than that institution.

OPERATIVE DELIVERIES

During the last twenty years hospital confinements have increased in number to such an extent that, in most large cities, from 60 to 75 per cent of all deliveries are institutional. In this connection, however, a corresponding increased incidence of the termination of labor by operation must be noted, as shown in various reports on obstetric practice made public in recent years. These disclose without exception an unchanging and rather high mortality rate. The accompanying morbidity rate has received little or no attention. For example, Plass states that from a study of Middle West statistics he found an incidence of operative deliveries varying from 10 to 20 per cent. In his opinion this should be not more than 5 per cent. Plass's estimate impresses me as conservative in comparison with other figures. The report on maternal mortality made by the Academy of Medicine of New York City presents the results of an inquiry into sixty-seven representative local institutions in which 74.7 per cent of all the hospital deliveries occurred. Among these, 24.3 per cent were operative. Approximately 348,000 live births took place during the three-year period under survey (1930-1932), of which it is estimated that over 69,000 were terminated by operative delivery, or about 20 per cent for the entire city. It may be assumed that the remainder were spontaneous. A total of 1,300 deaths in women delivered at or after the twenty-eighth week included 729 after operative delivery, a rate of about 10.5 per thousand live births, and 571 after spontaneous delivery, with a corresponding rate of 2. If all the deaths are taken together it is found that about 46 per cent followed operative deliveries.

There are many other interesting things in this carefully prepared report. The cesarean incidence in one New York hospital rose from 2 per thousand deliveries in 1910 to 25 in the same number in 1927. It may also be noted that 3.8 per cent of all deliveries in the private pavilion were by cesarean section, as compared with 1.2 per cent in the wards. A similar distribution was noted in another institution, 4.98 per cent among private patients and 3.28 per cent among ward patients.

An investigation of similar character made by a special committee of the Philadelphia Medical Society and prepared by Dr. Philip Williams presents an equally significant picture. In a three-year period (1931-1933) there were over 68,000 hospital deliveries, with approximately 19,000 of these operative and 49,000 spontaneous, or an incidence of almost 28 per cent. An interesting side light on the question of operative deliveries is the statement that in a one-year delivery service of 142 births there were eighteen cesarean sections. In another general hospital maternity service with practically an open staff, there was an operative incidence of 50 per cent in the private floors and 4 per cent in the wards. Were patients in the latter group neglected? The final results did not bear this out.

A recent survey (1933) of the obstetric work in Louisville, Ky., showed that among 5,262 deliveries 58.75 per cent were conducted in hospitals and 41.25 per cent at home. Ten years previously the percentage of hospital deliveries was only 18 and the maternal death rate was rather low, 0.35 per cent, or 35 per 10,000 live births. In 1933 the operative deliveries including forceps, versions and cesarean sections totaled 706, or 24 per cent. It may be noted that in the private hospitals, where the "family doctors" did most of the deliveries, the operative deliveries were about twice as frequent as in the municipal hospitals, where about 46 per cent of all the institutional deliveries were conducted. The cesarean sections likewise were about double; in two the rate was over 6 per cent. The year following this report a rule was put into effect in one of the latter institutions that cesarean sections could not be done without consultation; this resulted in an almost immediate reduction in the number of cases.

Further statistics on the subject of operative deliveries could be quoted and it might be of interest to draw

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comparisons with foreign institutions in respect to cesarean sections, for example. In the Dublin Rotunda in 1929-1930 the cesarean incidence was 1 to 100; at the Copenhagen Rigshospitalet during 1934 it was 1 to 184. These figures may be compared with 1 to 12 at the Boston Lying-In, 1 to 6 at Jefferson (Philadelphia) and 1 to 48 at the Chicago Lying-In Hospital. The Boston City Hospital shows an increase in cesarean sections from 26 per thousand in 1920 to 33.7 per thousand in 1929; other institutions report similar increases. In the New York series cesarean section was fatal in 310 cases among 793 deaths following operative deliveries—almost 20 per cent of the deaths during the three-year period from 1931 to 1934, excluding abortions and ectopic pregnancies.

The evident results from what should constitute a life-saving operation call for an inquiry into the relative frequency of cesarean section and the associated mortality. Many qualified observers believe that these results are due to ill advised widening of the indications, as well as quality, judgment and skill of the operator, together with operating in unsuitable surroundings.

The less frequent resort to cesarean section and other major operative deliveries in foreign maternity services may be explained probably in a number of ways, but one cannot help feeling that intervention is practiced on less evident indications in American institutions. This assumption cannot be regarded as otherwise than an indictment of the medical profession, and the latter must answer it. The evidence unfortunately cannot be brushed aside in the analyses of obstetric deaths that have been quoted, to which others may be added. The conclusion is reached that a reduction in maternal mortality is predicated first and foremost on competence, skill and judgment of the attendants, whether doctors, nurses or midwives. There are others, but these assume apparently a less important place.

In order to obtain a true insight into the situation, an effort was made in some of these studies to determine a preventability factor in the fatal cases by a careful scrutiny of the individual patients' records. The results are not very flattering to the medical profession. In the New York report it is claimed, for example, that the doctor must assume the burden of being at fault in more than half of the cases; in fact, as much as 65 per cent. Of course he was not the only one to be blamed—the patient herself as well as nurses, midwives and institutions all bear a share; but the doctor's seems to equal all the others combined. And why? Lack of competence, lack of judgment and carelessness are ascribed among the causes, and to these might be added lack of appreciation both on the part of the public and on the part of the medical profession of the proper conduct of childbirth. And why should there be such a lack of appreciation and how can it be overcome? I believe it is largely due to improper and insufficient training of medical students in schools and hospitals. Obstetrics should be made a major subject in the college curriculum, on a par with medicine and surgery, and this can be done only by increasing the number of hours devoted to instruction and, above all, to providing practical experience.

EXPLANATION OF HIGH PUERPERAL MORTALITY

Palmer Findley conducted an interesting survey of obstetric teaching in 1928 in which he found that, while in most countries the time given to the teaching of surgery as compared with obstetrics is approximately in the proportion of 2 to 1, in the United States it is in the neighborhood of 4½ to 1. It may be assumed that the consequences of inadequate attention to what should be made a major subject in the medical curriculum is reflected in the results of obstetric practice as they have been presented in recent years in numerous frank surveys. At any rate, should one not give thought to what is self evident before one looks for more complex explanations of the relatively high puerperal mortality rates?

Therefore I have direct and cogent reasons for calling attention to the foregoing facts and figures about the increasing resort to operative deliveries in obstetric practice. For, if their possible significance in relation to the attendant puerperal mortality is borne in mind, such an admission might aid in finding a cause should it be desired to take the steps for instituting a remedy.

Success must be measured by results, in medical practice as elsewhere. If one would measure results in obstetrics by a reduction in puerperal mortality, it might call for a revision of methods and procedures which, judging from the rather high death rate associated with child bearing in this country, have not been completely satisfactory or successful. This rate, it must be noted, averages about 6 per thousand live births. Should it be accepted as irreducible?

Now, it has been found that the principal causes of death in childbirth are hemorrhage, shock, sepsis and toxemia, and for this group a preventable factor must be assumed if any degree of credit is to be given to the advances made in obstetric science and art. On what should this preventability factor be based? The answer may be found in the puerperal mortality studies of recent years, to which reference has been made. In practically all these, if the particular death was considered avoidable, the blame is fixed on the doctors in a large proportion of cases. May I repeat the reasons? Actual incompetence in the attendant, lack of judgment, lack of skill, inattention to the demands of the case, all are unhesitatingly put forward as having a direct bearing on the fatal outcome. If incompetence occupies such an important place in these accusations, it can be overcome only by the development of greater "respect on the part of the physician for the gravity of obstetric operations and educating him to a greater caution in attacking problems which are properly the field only of the highly trained obstetrician." This quoted statement brings me to the essential point of my thesis; namely, that the medical schools have not balanced in their teaching the practical with the theoretical side, or they have failed to accord to obstetrics its right and proper share in the curriculum.

NEED FOR PRACTICAL TRAINING

In forty-six medical schools in the United States that have been investigated recently by the American Medical Association, the number of deliveries required of each student before graduation is as follows:

A. Fifteen or more, under supervision (as specified by Council on Medical Education and Hospitals), seven schools.

B. From one to fourteen deliveries, under supervision, twenty schools.

C. One or more deliveries, not complete supervision, sixteen schools.

D. No deliveries required, two schools.

The foregoing shows the lack of agreement and standardization in a most important teaching field and demands early correction if young physicians are to be equipped with an adequate knowledge of this essential

V 106
1936

branch of medicine. Practical experience in deliveries with suitable safeguards can and should be provided, so that a student will be impressed duly with the significance of proper and adequate obstetric care. Attendance in the antepartum clinic and at a certain number of labors should be provided in hospitals directly associated with medical schools, or such practical training may be secured after graduation if the former was not available. At any rate, licensure to practice should include a requirement uniform throughout the country that the candidate has attended and conducted a definite number of deliveries, the number to be fixed possibly by the National Board of Medical Examiners or similar examining body.

In this connection another matter may be considered which has an important bearing on obstetric training. There are many large general hospitals in this country without maternity services. Their interns have no opportunity to acquire knowledge in delivery procedures. Moreover, many are known to maintain an attitude of aloofness toward obstetrics and thus detract from the importance of the subject as an essential element in the training of their intern staff. Objection has been made to the practice of obstetrics in a general hospital. This is quite another matter and I am not prepared to discuss the question, but I do feel that the importance of an adequate training in obstetrics by every hospital graduate is paramount. If it cannot be provided in the institution, arrangements should be made to obtain it elsewhere under proper affiliations, so that every intern would be assured of this important element in his training. The American Medical Association and the American College of Surgeons might well make a concerted effort to incorporate such a requirement in the intern teaching curriculum of every general hospital. I believe that this step would do much to dignify the position of obstetrics in the minds of recent graduates in medicine.

May I be permitted to reiterate my contention that a thorough knowledge of obstetrics should be an essential in the training of every physician. If he decides to go into some other special field this need be no hindrance, and if he goes into general practice he will have more opportunities for deliveries than he will for appendectomies or cholecystectomies. Therefore he must be fully prepared and, as pregnancy and labor are largely normal processes, he must be thoroughly grounded in their physiology and mechanism. I sometimes feel that the designation of labor as a surgical procedure is an error. Truly it must be conducted with due regard to the principles of surgical cleanliness; but an expansion of this idea has led many students to interpret it necessarily as an operative procedure. Intervention, however, frequently spells trouble, especially if carried out by incompetent persons.

How can the gap be bridged between theoretical knowledge acquired by the student in his medical school and its application as executed by him in the rôle of a practitioner? If the graduate in medicine has failed to realize that in most pregnancies he is a guide and mentor selected to steer his patient between Scylla and Charybdis but interprets the case as essentially a surgical possibility, a continuation of those unnecessarily high mortality figures associated with obstetric practice in this country must be expected.

Obstetric science has progressed to a degree at which books of encyclopedic dimensions seem required to encompass all the knowledge which has accumulated since that period half a century ago when a single volume textbook of moderate size was sufficient for all purposes. Most of this accumulated knowledge will never become available to the student, but the attempt to include much of it in the curriculum is apt to confuse his mind; he loses sight of the well known facts about pregnancy and labor in the maze of chemical, pathologic, serologic and other details of value in themselves but not essential to acquiring a working knowledge of obstetrics. Obstetric care must be simplified and made less complicated. The test tube and the kymograph seem to have displaced the hand, the eye and the stethoscope. Though this statement may perhaps be a mild exaggeration, the fact remains that obstetrics is being practiced largely as a surgical specialty in many places and with questionable results if we are to judge the outcome by the present mortality rates. It would appear necessary to shift this point of view and to increase clinical teaching on the patient rather than to devote more time to the microscope and the chemical laboratory.

As a result of certain tendencies manifested in some leading maternity hospitals, apparently a comparatively small group of superobstetricians are being educated who cannot help being permeated with the idea that pregnancy is an abnormal process and must be treated as such. Rather a knowledge of the subject should be inculcated into the minds of the student and intern body which will make them realize their proper function as guides and supervisors rather than as operators. This requires a close contact between student and teacher and patient, a contact that is not always possible in all its aspects in a hospital alone. I believe that much of this knowledge can be obtained in home delivery service. The suggestion that this type of clinical work be extended may meet with opposition, but the results speak for themselves. I believe that every medical student should conduct personally, under direct and proper supervision, at least twelve, but preferably more confinements and that a certain number of these should be in homes. This would mean naturally that such patients must be carefully studied beforehand in the antepartum clinic as to their suitability for domiciliary care, that a change of sentiment must be developed among certain population groups to have their babies at home and that safety of the mother is not sacrificed by this procedure. On the contrary, clinical opportunities of this kind will indelibly impress on the student the fact that labor is a physiologic process, that it can be conducted in simple surroundings, that routine narcosis or analgesia is not essential, that operative deliveries must present clear-cut indications and can be done only under proper auspices, and that their need can usually be predicted in advance. Services of this nature have been conducted in various places; their value and success may be measured by the low mortality and morbidity among their patients. At the old Lying-In Hospital in New York, for example, thousands of women were successfully delivered in their homes by students and interns under careful supervision. In Chicago there is being conducted an outdoor service in which, during a two-year period from 1932 to 1934, over 6,500 women were confined at home with only twelve deaths, a rate of 0.17 per cent. Of these, nine died after transfer to a hospital for various reasons. The operative incidence was about 4 per cent, mostly forceps. The deliveries were all carried out by interns and senior medical students and under careful supervision.

In other cities similar services have been conducted which, in view of the attendant low mortality and morbidity rates, must be regarded as successful and adequate for the population groups which they serve. They have shown among other things that women who are up and about get through with their labors in a shorter time; that less operative intervention is required; that less sepsis results, probably because there are fewer contacts. In addition, the fact is made self evident to the student that the processes of labor are essentially natural processes, that he must become thoroughly familiar with their mechanism, that accidents are possible but may be largely avoided by exercising a knowledge of their prevention gained through the medium of his previous theoretical instruction. It may take time to instil into the minds of teachers of obstetrics the practical value of more direct and responsible contact between student and patient, but it is only in this manner that the resourcefulness can be cultivated which is so essential in the conduct of labor. Obstetric improvement cannot be measured by successful delivery in a series of versions, forceps or cesarean sections conducted in elaborately equipped institutions; rather it must be gaged by the results in the country at large as measured by the prevailing maternal mortality rates, and these at the present time are none too favorable.

The question might be asked, Shall we throw aside accumulated knowledge of the science of obstetrics and practice it merely as an art? There is no need for this assumption. One must remember that pregnancy is not a disease, that it usually pursues a fairly normal course, that occasionally it develops pathologic aspects, that accidents in labor are comparatively rare, that adequate antepartum care will avoid such subsequent trouble. In assuming the foregoing, does it mean that science is to be sacrificed for art? Not at all. On the contrary, theoretical and didactic teaching is essential to a proper understanding of the phenomena of pregnancy and labor, but it must not be permitted to cloud the issue. I feel that practical experience gained by actual contact with patients, preceded by properly acquired theoretical knowledge, will do much to establish a definite relationship between the art and science of obstetrics which cannot but redound to the credit of the medical profession.

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The Floor of the Third Ventricle.—The third ventricle is a midline cavity. In cross sections of the brain it is somewhat lenticular in shape while in sagittal sections it appears more or less trapezoidal. Rostrally it is connected with the lateral ventricles by the foramen of Monro and caudally with the fourth ventricle by the aqueduct of Sylvius. In the dorsoventral direction the rostral boundary is formed by the foramen of Monro, the anterior pillars of the fornix, anterior commissure and lamina terminalis. The floor is formed by the optic chiasm, infundibulum, tuber cinereum, corpora mamillaria, posterior perforated space, cerebral peduncles and tegmentum of the midbrain. Ventrodorsally the posterior boundary consists of the rostral end of the aqueduct of Sylvius, posterior commissure, pineal recess, pineal body and supraspineal recess. The roof is composed of a thin layer of epithelium stretching between the thalami (velum interpositum) which covers the parasagittal strips of choroid plexus which run throughout the length of the roof of the third ventricle. The lateral walls are formed by the medial surfaces of the thalami and the hypothalamus.—Davidoff, L. M., and Dyke, C. G.: The Demonstration of Normal Cerebral Structures by Means of Encephalography: V. The Ventricles, Interventricular Foramina, and Aqueduct of Sylvius, *Bull. Neurol. Inst. New York* 4:91 (March) 1935.

THE PUBLIC HEALTH ASPECT OF THE TEACHING OF OBSTETRICS

IN UNDERGRADUATE MEDICAL SCHOOLS

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The maternal mortality rate has decreased but little during the last twenty years. This is in spite of important advances in other branches of medicine, including medical research and public health education.

It is the general opinion that the time allotted to the teaching of obstetrics is too limited. Rowland [1] has shown that 50 per cent of the general practitioner's time is devoted to medicine, from 25 to 35 per cent to obstetrics and the remainder to minor surgery, gynecology and a few special cases. In all the published curriculums, obstetrics, which occupies at least 30 per cent of the general practitioner's time, is allowed only 4 per cent of the total time provided for a medical course, while surgery, which occupies less than 10 per cent of the practitioner's time, is given from 15 to 18 per cent of the hours allotted to the medical course.

Questionnaires were sent to fourteen medical schools throughout the country and replies were received from eleven; [2] only one required a thesis in obstetrics for graduation. In six schools the course in obstetrics was a combined course with gynecology and the exact number of hours devoted to the teaching of obstetrics could not be ascertained. Approximately 150 hours is devoted to the teaching of obstetrics in lectures and practical work in the curriculums reviewed. The clinical facilities appeared to be very limited in the majority of schools answering the questionnaire.

The information supplied by the colleges answering the questionnaire indicated that the clinical facilities in the majority of instances are limited and in some the student is not required to attend personally any definite number of confinement cases. One school required each student to attend six cases, and the highest number required was twelve. The lectures and demonstrations are supplemented by ward rounds and the student is assigned to cases, which he follows throughout labor and the puerperium. Operative procedure in obstetrics, the diagnosis of fetal position and pelvic mensuration are given in manikin courses. Lectures illustrated by motion pictures also form part of the course. The internship on obstetrics in most of the hospitals is limited to two months. However, in three hospitals from which information was obtained, the internship in obstetrics is for a full year.

From the information obtained by questionnaire and the data presented by Rowland, it is apparent that medical schools should raise their requirements in obstetrics before granting the degree of doctor of medicine to include the following prerequisites: allocation of at least as many hours to clinical obstetrics as to clinical surgery; the provision of an adequate number of hospital beds and patients to furnish the necessary clinical material; detailed instruction in antepartum and postpartum cases; supervision of the students' dispensary and hospital work by a competent obstetrician; personal deliv-

V 106
1936

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1. Rowland, J. M. H.: Teaching of Obstetrics, Bull. A. Am. M. Coll. 1:82, 1925; Reduction of Mortality and Morbidity in Childbirth, J. A. M. A. 87:2138-2139 (Dec. 25) 1926.

2. Replies to questionnaires were received from the following medical schools: Vanderbilt, University of Minnesota, University of Maryland, Yale University, Harvard University, Stanford University, University of Chicago, University of Michigan, Tulane University and Johns Hopkins University.

ery of at least twenty patients, and attendance on the delivery of numerous complicated cases in the hands of a master obstetrician. When one considers the emergencies encountered in the practice of obstetrics as compared with those met in other branches of medicine, the present division of time seems still less defensible.

Preventive medicine has worked wonders in reducing the mortality rate from many internal diseases. There is need for similar activity in the field of obstetrics. The development of more and still more teaching maternity hospitals for the better training of medical students, nurses and midwives in the art of obstetrics and the intelligent cooperation of the lay public and the profession in the care of the expectant mother will do for obstetrics what preventive medicine has done in the general field of medicine. However, an awakening of interest is going on in the preventive phase of obstetrics. The leaders in the field of obstetrics are stressing the need of vigilant antepartum care. It is this preventive phase of activity that gives promise of placing obstetrics more nearly alongside medicine and surgery in the onward progress of our science.

A better understanding of the needs for more intensive teaching in the public health aspect of obstetrics may be better appreciated by reference to the statistics on puerperal deaths. The puerperal death rates per thousand live births in the United States registration area show very little variation for the five year period 1930-1934. The highest rate for the period was 6.7 in 1930 and the lowest was 5.9 in 1934. In the United States registration area for the period 1930-1934 the total number of maternal deaths attributed to special causes was: abortions with septic conditions, 10,277; abortions without mention of septic condition (to include hemorrhages), 3,240; ectopic gestation, 2,926; other accidents of pregnancy (not to include hemorrhages), 523; puerperal hemorrhage, 7,085; puerperal septicemia (not specified as due to abortion), 14,741; puerperal albuminuria and eclampsia, 14,226; other toxemias of pregnancy, 2,605, and 12,041 due to other complications of childbirth. A total of 67,664 maternal deaths occurred in the five year period 1930-1934.

From the foregoing data, abortions, puerperal hemorrhage, puerperal septicemia, albuminuria, eclampsia and toxemias of pregnancy stand out as the cause of 77.1 per cent of maternal deaths during the years 1930-1934. The majority of these maternal deaths can be prevented. The medical officer of health of Newcastle suggests that the real cause of maternal mortality is the inadequate cooperation between the physician or midwife and the patient. The facts challenge the public health organizations and the medical profession to determine the reasons for this loss of life incident to childbirth and then, so far as possible, to prevent them.

If it is true that the majority of maternal deaths are preventable and that these deaths are largely due to albuminuria, eclampsia, toxemias of pregnancy and abortions, it is obvious that there rests great responsibility on our medical schools for more adequate teaching of obstetrics, including adequate preventive care. The importance of adequate antepartum care is generally recognized. It should include complete pelvic measurements, blood pressure determination, urinary analysis, complete physical examinations, Wassermann tests and appropriate arrangements for delivery.

The majority of the causes of maternal deaths have their beginning early in pregnancy, and so far as the health department is concerned the most logical approach to the solution of the problem appears to be the establishment of antepartum clinics conducted by competent obstetricians and the education of the women of the country to the necessity of consulting their family physicians early in their pregnancy, whether they are primiparas or multiparas, as the safe delivery in one pregnancy is no assurance against serious complications in a subsequent pregnancy.

The Maryland State Department of Health, through the Bureau of Child Hygiene and in cooperation with the county health officers, established antepartum clinics in 1928. The number of counties holding clinics gradually increased from one county in 1928 to eighteen counties in 1935, when 280 clinics were held throughout the year. The increase in attendance has been most encouraging—from fifteen in 1928 to 949 in 1935.

In 1934, of the 682 women attending the clinics 264 were white and 418 colored; 170 were primiparas, 504 multiparas and the data on eight are incomplete. Among this group, sixty were found with contracted pelves, eighty-six had hypertension and seventy had syphilis. Four hundred and twenty-seven went through a normal delivery. Six deliveries were instrumental and eight cesarean sections. Five patients had a breech presentation. There were three operations and three miscarriages. Spontaneous abortion occurred twice and there was foot presentation in one case. One month after delivery, 444 mothers were investigated, of whom 436 were found well and eight ill. Of the 412 babies investigated, 398 were alive and fourteen had died.

During 1935 a total of 949 women, 341 white and 608 colored, made 2,007 visits to the antepartum clinics for examination and advice. Of the total number of visits made, 1,678 were antepartum visits and 329 postpartum visits. The attendance at the clinics has shown a marked increase and the service is apparently gaining favor with both the expectant mother and the practicing physician. In the counties in which clinics were held in 1935 a total of 980 Wassermann tests were taken, of which 16.3 per cent were positive. In the positive cases, either antisyphilitic treatment was instituted by the local health department or the patient was referred to a private physician for treatment.

The health officer of Worcester County reported in 1935 that, of Wassermann tests taken in twenty-one antepartum cases, eleven, or 52 per cent, were positive. One woman in this series gave a moderately positive reaction with no history of previous primary or secondary lesions. She had one previous pregnancy in 1933, the child born alive to die two days after birth. Her husband gave a negative Wassermann reaction and it would appear that the woman's infection was congenital and that the latency of the infection prevented her from infecting her husband but was of a serious enough nature to be fatal to her child.

In 1916, 13.5 per cent of the white women in rural Maryland were delivered by midwives and in 1934 the number of deliveries by midwives had decreased to 5.4 per cent. For the colored population in 1916 the number of women delivered by midwives was 59.9 per cent and in 1934 had decreased to only 51.2 per cent.

The maternal death rate was 5.0 per thousand live births for 1935, showing a slight drop from the rate of 5.2 for 1934. Ninety of these mothers were white women and forty-seven were colored. Accidents caused fifty-nine deaths, septicemia forty, and albuminuria and convulsions twenty-seven. It is gratifying to note that no deaths occurred among the women who attended the antepartum clinics in 1934 and but one death in 1935 among the 949 women attending the antepartum clinics.

The 1,698 deaths under 1 year of age recorded in Maryland gave an infant mortality rate of 62.1 per thousand live births. This was by far the lowest rate on record and 11.8 per cent lower than the rate of 70.4 for 1934. The rate for white infants was 51.7 and that for colored infants 99.8. Fifty-three per cent of the total infant deaths occurred under 1 month of age. Diseases of early infancy, including premature birth, injury at birth and congenital debility, caused 43 per cent of the total infant mortality. This neonatal mortality and the loss of lives through stillbirths can be controlled only by continuous care of the mothers.

To say that adequate antepartum care is necessary to good obstetric practice seems superfluous. It is safe to assert that 50 per cent of the expectant women in the counties at present come to delivery without this care. Minimum standards of antepartum care should include general physical examination with measurement of the pelvis, and a visit to the clinic or family physician at least every three weeks up to the seventh month and fortnightly thereafter, at which time observations should be made to determine the progress of pregnancy. Toxemias of pregnancy generally begin early in pregnancy and the patient should be questioned as to such symptoms as headache, bleeding, edema, constipation, presternal pain, vertigo and disturbance of vision. Early and regular examinations of the urine and determination of the blood pressure will serve as indicators as to beginning symptoms of toxemia. The hygiene of pregnancy as to diet, rest and exercise should be outlined at the first visit and frequently referred to at subsequent visits. Urinary analysis, a Wassermann test and determination of blood pressure should be routine.

The student should be taught that the most intensive antepartum care will be of little avail if the patient is infected at delivery. As the majority of cases are infected by induction from without it should be impressed on students that, in most instances, watchful waiting is better than meddlesome intervention. Preparation of the patient should be as painstaking as for major surgery. Rectal examination to determine the progress of labor should be thoroughly taught and vaginal examination made only in exceptional cases.

The expectant mother must be taught to seek antepartum care early. I was gratified at a recent county medical meeting to hear a country physician say that lately a large number of women had called at his office for antepartum care. The reason for the sudden increase of interest on the part of the expectant mother, I was informed, was the articles published in the local newspapers by the state department of health on antepartum care.

Much can be accomplished by a local maternal welfare committee with the county as a unit. The program of such a committee should be based on a survey of maternal facilities of the county: a survey of all maternal deaths in the county with inquiry as to all the contributing causes. As public health officials, our opportunities of reaching the undergraduate medical students are not great—our greatest opportunity and responsibility is with the physician, public health nurse and the women themselves.

In rural Maryland an effort to reach the physician has been made by lectures under the auspices of the Bureau of Child Hygiene and the extension work of the University of Maryland Medical School. These lectures have been given to groups of physicians and nurses in a series of six lectures. Interest seems to have been aroused and the attendance has been encouraging, numbering about twenty-five in the smallest group to about seventy in the largest.

Emphasis is placed on the need of having patients report early and frequently to the physician and the need of a simple but careful record of each case. The student should be impressed with the essential requirements: a record for birth certificates, the history previous to marriage, the history of previous pregnancies and the present pregnancy, and the relative value of various facts found. The previous medical history should ascertain the history of tuberculosis, cardiac trouble, scarlet fever, rheumatism and nephritis. In the obstetric history such information as miscarriage, forceps deliveries, toxemias, hemorrhage, stillbirths, infections and cesarean section should be recorded.

An intelligent correlation of facts found will determine the value of the history to the physician. A history that records a miscarriage in the first pregnancy, followed by normal pregnancies and labors, is not of such importance as one that records a normal pregnancy followed by one or two miscarriages; and a first labor terminated by forceps and followed by subsequent spontaneous labor is common, while one or two labors terminating spontaneously, followed by forceps deliveries in subsequent labors, may have a profound significance.

In these extension courses, the value of careful physical examination is stressed: the size and shape of the uterus, measurement of the pelvis and palpation of the fetus as to presentation and position. Emphasis is placed on the need of careful advice about exercise, diet, clothing and constipation, and it is urged that the patient report headache, constipation, edema, hemorrhage and pain and return at regular intervals. The instruction by the physician to the patient in the matter of preparation for labor, emphasizing the necessity for cleanliness, is stressed. The public health or welfare nurse should have careful supervision of all her cases. More confidence is frequently placed in the instructions given by the nurse than those given by the physician. The education of the public must come through women's clubs, church societies and political groups of women.

Rowland has suggested for propaganda to the lay public the following important facts: That child-bearing in this stage of our civilization is no longer necessarily a physiologic process; pregnant women should report to their physician as early as the condition is known; careful supervision at relative short intervals is necessary to prevent many of the complications of pregnancy and childbirth; headache, edema, constipation or hemorrhage of any degree may mean trouble if not relieved; examination of urine, blood pressure, measurements and weight of the mother should be a routine procedure; careful examination, including examination of the pregnant uterus and measurements of the pelvis, are necessary; careful preparation for delivery frequently saves trouble in labor; and, finally, the physician who wants no record of the patient's history, who does not require her to visit him regularly and who does not wish to known anything about her until she is in labor is not the physician who should attend her.

Some day women will learn that relief from past experience lies in competent scientific obstetrics. That day will be hastened if we prepare students to render the service the child-bearing woman needs, to apply preventive measures promptly and to secure for the maternity case the best of professional care.

2411 North Charles Street.

V 106
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UNDERGRADUATE OBSTETRIC EDUCATION

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One should keep constantly in mind the main purpose of undergraduate medical education in discussing any phase of it. The principal objective is, to my mind, the laying of the foundations for a knowledge of medicine on which subsequent structures can be built for general or special practice and for teaching or research and for public health activities. It is not to be supposed that any student can be properly qualified to enter satisfactorily on any or all of these fields at the time of graduation. It is essential that the student should be able to correlate the various special fields of medicine in terms of the individual patient. He should also learn that while he is responsible for the care of the individual he has a large responsibility to the community in carrying on his professional work. He must be imbued with the idea that medicine has to do with prophylaxis as well as cure and that prevention of disease and maintenance of health are often of greater significance than the cure of an individual patient of some illness.

The teachers of obstetrics should attempt to inculcate these ideas into the minds of their students with regard to maternity care. It is also important to convey the idea that the purpose of obstetric teaching is not to enable one to take care of the condition of pregnancy, labor and the puerperium but to care for the complete woman who is at the time pregnant, in labor or in the puerperium. The fact must be stressed that the woman is important not only for herself but also because of her relationship to the community.

In considering hours for students it must be assumed that each one of them is employing full time and energy in preparation for his life work. It is not the absolute hours arbitrarily assigned to different fields of medical study that are important; it is the relative amount required for each. Our efforts should be to keep the absolutely required hours at a minimum level and to maintain a ratio between the different branches of medicine which is consistent with their relative importance to the undergraduate student of medicine. It is essential to keep constantly in mind the underlying principle that the undergraduate student must acquire the fundamental facts of the science and art of general medicine. His knowledge of prophylaxis and cure are of vital importance both to the patient and to the community.

In arranging the curriculum it is imperative to keep in mind that all branches of medicine are closely correlated and that knowledge of one increases the knowledge of another. Internal medicine contributes much information of value to the obstetrician relative to various diseases, especially those of the cardiovascular renal systems and infectious diseases. Surgery contributes enormously to the fundamental knowledge of operative technic and asepsis. Pediatric information is invaluable to the obstetrician who assumes responsibilities for mother, fetus and new-born infant. Medicine, surgery and pediatrics have much more in common with one another than they have with obstetrics except for the close association of obstetrics and pediatrics so far as infant care is concerned.

It must be remembered that obstetrics presents new aspects relative to history taking and methods of physical examination as well as of terminology and a physiology and pathology that are essentially different from any of the other branches of medicine. The physiology and pathology are essentially the same for the other branches of medicine except for the variations due to age, structures involved, and so on. Of course the treatment varies, being nonoperative in pediatrics and medicine and operative in surgery.

It is therefore essential that sufficient time be allowed to the student in which to acquire knowledge of the more remote results of obstetrics which are apparent in gynecology as well as to acquire knowledge of the fundamentals. Much of the student's time in hours can be conserved if obstetrics and gynecology are taught by members of a combined department rather than by those of different departments, and the data will be better coordinated. Many of the disorders of the female genitalia are the result of childbearing, and the student should derive a better understanding of the sequence of events if the instructor traces their development from the delivery of the infant to a later period of the woman's life. This can be done best in a unified department of obstetrics and gynecology and affords better preparation for the prospective doctor to care for his female patients through their life cycle.

The advantages of such a combined department for the undergraduate student are the greater facilities that may be obtained, by the avoidance of unnecessary duplication, for the same budgetary expenditure; better correlation of factual data, and a clearer picture of the life cycle of the patient. The inspiration of the student should be greater and the instruction better because more capable men should be attracted to this combined field on account of the greater opportunities afforded for service, study and investigation. Such a stimulus and opportunity should tend to obviate mediocrity in the teaching of obstetrics.

There is not sufficient time to discuss the details of the instruction which should be imparted to the student. In general he should acquire the necessary knowledge regarding preconceptional, antepartum, delivery, postpartum and postnatal care. In short, he should know the fundamentals of human reproduction from a medical point of view at least.

How is this knowledge to be imparted? It can be acquired by reading, but formal instruction should be of added value because an experienced clinician and teacher can select the essentials, stress the more important details, and clarify the obscure facts. A certain amount of formal instruction would seem to be necessary. The opportunity to see, examine and follow both normal and abnormal cases affords the very best means of instruction. It should be possible to observe patients who are ambulatory, those who are confined in the home or hospital, and those who pass through an uncomplicated or a complicated puerperium. There are many conditions which can be demonstrated clearly by pictures, both still and moving, by models and by manikins which cannot be shown well on the living subject, as too much has to be left to the imagination. It is possible to have the student practice many procedures on the manikin which one would not be justified in permitting on the living woman.

Instruction in obstetrics is fundamental and vital for the adequate care of the individual woman and for the best interest of the community. Much of the ignominy that has been heaped on obstetric practice on the score of maternal mortality could have been prevented by better educational methods in the past and by better facilities in the present. I would stress again that mor-

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tality is only one criterion of results. The fact should not be lost sight of that great relief of pain has been obtained by the use of analgesics and anesthetics which do increase the risk to life both directly and indirectly even though the increased hazard is very slight. It should be recognized that longevity has probably been increased for both the mother and the infant by modern obstetric practice. It should not be forgotten that much of the disability that previously arose has been reduced. Certainly fewer genital fistulas are seen and one would hardly deny the probability that the remote results of trauma, such as genital prolapse, are less common today than they were a generation ago.

While the number of fatal cases of sepsis and of toxemia have not been materially reduced, apparently those fatalities resulting from the delivery of viable children have been curtailed and the serious sequelae in those women who have lived have been lessened.

Lastly, the blame for the high maternal mortality rate has been placed on the increased incidence of obstetric operation with apparent ignoring of the probability that not the operation per se but its improper selection and performance is responsible. Surgical procedures have increased enormously for numerous conditions which produce disability or cause discomfort but do not threaten life. The newly graduated student is not considered competent to perform these operations.

It should be emphatically stated that the delivery of ten, twelve or fifteen obstetric patients by any student does not qualify him to perform obstetric operations.

One important fact for every doctor and for every medical institution to recognize is that while a graduate and licentiate may be legally entitled to practice the science and art of medicine in all its branches he is not necessarily qualified to do so. Both he and the institutions in which he works and society must realize that such is not the case.

Undergraduate teaching in obstetrics as well as in other branches of medicine lays only the groundwork for practice. Unless the student is taught and made to realize what he can and should do as well as what he cannot and should not attempt, the education has been a failure.

Emergencies always constitute exceptions and unfortunately there is no field of medical practice in which sudden emergencies are fraught with so great dangers to two individuals so frequently.

Instruction and facilities for undergraduate obstetric education are still inadequate, but our facilities are not all being utilized for either undergraduate teaching or the training of interns.

Many schools have inadequate hours and facilities for proper obstetric teaching, especially from a clinical point of view. There are many hospitals in which maternity cases are taken care of, and in these more teaching should be done; but they must conduct their maternity care on a plane high enough to give proper instruction to the students and to the interns who come under their egis. One vitally important factor for teaching in these institutions is a well trained staff which is interested in teaching proper maternity care.

Obstetric teaching of undergraduates requires adequate proportionate time, ample facilities and capable instructors. It is important to carry out this program in all schools as quickly as possible, because even after they are accomplished it will still be ten or fifteen years before the results are generally realized by the public.

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USE OF THE OUTPATIENT DEPARTMENT IN MEDICAL EDUCATION

NEWER POINTS OF VIEW

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A properly organized and conducted outpatient department offers educational opportunities for the medical student, intern, practitioner, nurse and social worker which cannot be duplicated in the classroom, the hospital or private practice. The type of training that is offered in the outpatient department is absolutely essential for the complete education of the physician or nurse.

Great changes have taken place in medical education in the past generation. It has come to be realized that the student must be taught more than disease pictures and the underlying sciences. The physician now occupies a different place in society. The physician is no longer thought of merely as a person who is called in to minister to the acutely ill patient. The medical course has been arranged so as to equip the physician to take his place in the changing social order. Subjects have been introduced in the medical curriculum that previously were never considered. There are departments of preventive medicine, of psychobiology, of social service. The student studies more than disease: he studies man as an individual both in health and in sickness, as influenced by his environment. Preventive medicine is emphasized. There has come a greater appreciation of the importance of the psychologic approach to medical problems. This does not imply the psychiatric approach. Almost every patient presents a psychologic problem, rarely a psychiatric one. The psychology of medicine can properly be studied only in connection with the general examination of the patient, not as an isolated subject. The social aspects of medicine are now appreciated as never before. Medical economics has become a very live and pertinent subject. None of these subjects can be taught didactically in the classroom. They can be taught but imperfectly in the hospital wards. It is in the clinic that the student learns them through actual practical experience.

An outpatient department of the right type is a model institution for the care of the patient, and this implies more than the mere relief of medical symptoms—it implies complete health service. The clinic should function not only to cure the individual when he is sick but to keep him well. The modern outpatient department is very different from the older type of dispensary, which was little more than a medical "soup kitchen" from which drugs were dispensed for the relief of urgent symptoms, and where little or no effort was made to render adequate medical service by way of complete medical examination, diagnosis or treatment. The modern clinic differs also from the older type of hospital outpatient department, which was operated largely as a "feeder" for the hospital. The modern clinic attempts to keep the patient out of the hospital if it is at all possible to do so and still render adequate medical service. In the proper type of clinic the same standards of thorough examination are adhered to as

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V 106
1936

in the hospital. Unless an outpatient department is properly conducted, it serves no useful purpose in medical education. Indeed, attendance of a student in a poorly conducted dispensary may actually be detrimental to him in establishing bad habits of cursory examination or inadequate handling of patients.

ESSENTIALS OF AN OUTPATIENT DEPARTMENT

The first and most important essential of an outpatient department that is to be of value from the teaching standpoint is a competent staff. It takes a much better man to detect from the history or symptoms the premonitory evidences of disease than to diagnose serious illness after marked pathologic and physiologic changes have occurred in the body. Almost any physician may become familiar with the textbook descriptions of serious disease. There is little in the textbooks on the subject of the ambulatory patient and the early evidences of disease. That can be learned only from the most careful observation of many patients of different types. Normal physical diagnosis is spoken of, yet different individuals fall into different types and the physical signs are quite distinct. Failure to appreciate this may lead to gross misinterpretations of the conditions found. The keenest clinicians and the most accurate observers are those who should care for patients and teach in the outpatient department. In every division of the clinic there should be present daily at least one senior physician who serves as a consultant to the other members of the clinical staff and who actively participates in the teaching of students. Attendance in the outpatient department should not be below the diginity of the head of a clinical department.

The staff must have available necessary facilities for as complete examination and treatment as is possible in the case of the ambulatory patient. There should be clinical pathologic, chemical, metabolic, electrocardiographic and radiologic laboratories easily accessible and departments of physical therapy and mechanotherapy. A properly organized social service department is essential, for with many patients the social service department can supply essential information that may be the most important factor in the patient's condition and in his treatment.

Complete and accurate records filed so as to be readily accessible are as important in the outpatient department as in the hospital. It is most desirable that the outpatient record should be continuous with the hospital record for those patients who are hospitalized.

An outpatient department is to be judged by the character of the work done rather than by the size of its clientele. It is essential therefore that the clientele be strictly limited to the number of patients who may be adequately examined. For the best work an appointment system is necessary, at least in certain of the major clinics such as general medicine and pediatrics. Except in the case of obviously minor or uncomplicated conditions such as injuries, refractive errors, certain orthopedic conditions and parasitic skin diseases, every patient on first presenting himself to the clinic should receive a complete medical examination, and information as to social conditions should be obtained. The shunting of patients by a person at the admitting desk to special clinics on the basis of what the patient states to be his chief complaint all too often results in entirely inadequate examination and medical service.

When a patient applies to a clinic for treatment, it is the duty of the clinic not only to relieve the chief complaint but to make a complete health appraisal and to investigate the patient's past history for any circumstances that might reveal the existence of conditions other than those which impel the patient to seek medical advice. The story of the patient's environment, his home and working conditions and his financial status may at times give information as important as a strictly medical history. The physical examination should be thorough, with special attention to the discovery of incipient disease. In very many instances there will be no definite physical signs, for the condition from which the patient suffers may not have brought about structural changes. The psychologic aspects cannot be neglected, for psychobiologic disturbance may be as incapacitating as organic disease. The patient as a whole must be considered. As aptly expressed by the late Francis W. Peabody, "A 'clinical picture' is not just a photograph of a man sick in bed; it is an impressionistic painting of the patient surrounded by his home, his work, his relations, his friends, his joys, sorrows, hopes and fears. Now, all of this background of sickness which bears so strongly on the symptomatology is liable to be lost sight of in the hospital; I say 'liable to' because it is not by any means always lost sight of, and because I believe that by making a constant and conscious effort one can almost always bring it out into its proper perspective. The difficulty is that in the hospital one gets into the habit of using the oil immersion lens instead of the low power, and focuses too intently on the center of the field."

After the complete examination of the individual, which, as already stated, means more than the detection of physical signs, he should be referred if necessary to special clinics for examination or specialized methods of treatment but should in any event report back to the original examining physician for interpretation of the results, and complete recommendations as to care and treatment. It is this original examining physician (or student) who acts in the capacity of the patient's family physician. It is his responsibility to advise the patient not only as to the relief of symptoms but as to his entire health program. This obviously may involve much more than the taking of a bottle of medicine or having his nose sprayed or receiving a course of intravenous injections. The patient should be advised not only how to get well but how to stay well. Ideally the physician should visit the patient in his home; but this unfortunately not being practical in clinic organization, the social service worker vicariously performs this function and acts to interpret the physician to the patient and the patient and his surroundings to the physician.

If the patient has to be hospitalized, the clinic physician or student should if possible continue the care or at least observation of the patient. After relief of the prominent symptoms the patient should not be "discharged." He should continue to return at intervals for periodic check-up. This is the true ideal of the health clinic for the application of the principles of preventive medicine.

WHAT THE STUDENT CAN LEARN

An outpatient department organized as outlined provides the ideal training ground for the medical student or physician. In the hospital wards and in the autopsy room, attention is centered on disease rather than on the patient and here disease may be studied under most favorable conditions. Through the observation of a group of cases of pneumonia, the student learns the

manifestations of the disease, its natural course, diagnostic criteria, therapeutic indications and responses to therapeutic procedures. If the patient dies, the anatomic alterations produced may be studied. What the student studies is pneumonia rather than the patient who has accommodatingly developed the disease. Once the patient has recovered, the student, and all too often the physician, has but little further interest in the case. In the hospital ward the student learns about disease, in the outpatient department he learns how to practice medicine. By serving the clinic patient, he learns what service his own patients who come to him later should receive. The patient who has become incapacitated or who has developed some condition that interferes with his efficiency wants to know how he can be put in good shape again and get back to his job. He also wants to know how he can keep in good condition thereafter. In the clinic the student deals with the patient as a human being, not as a "case" of disease, and it is with human beings that the physician will later have to deal. Relatively little of his practice will be concerned with the serious illnesses requiring hospitalization.

A student working in the proper type of outpatient department quickly learns the importance of the personal relationship between physician and patient. He learns that every patient likes and needs to have some one person whom he can consider as his doctor and general adviser. The student gains a fuller appreciation of the invaluable service that may be rendered by the "family physician" or "general practitioner" and will become less inclined to feel that it is only the specialist who is worth while. The student learns the importance of the complete examination of the patient and is therefore not likely to develop into that type of specialist who sees but a single region of the body separated from the remainder, the type of specialist who tends to bring specialization into disrepute. More general practitioners of the better type are needed in these days, when there is too much of a tendency for the patient to make his own diagnosis and go to whom he assumes to be the proper specialist, from whom all too often he receives advice and treatment that is entirely inadequate so far as his general condition is concerned or may be actually detrimental. Every patient needs a personal family physician who will be intimately acquainted with his whole history and surroundings and who will be able to advise the patient when the services of a specialist are necessary and interpret to him the recommendations of the specialist. It is while working in the general medical clinic that the student learns to play the rôle of the patient's family physician. Later, as he works in the special clinics, the student learns to appreciate the proper place of the specialist and the attitude of specialists of the better type toward the general care of the patient. In the clinic the student also learns the value of the health clinic and the periodic physical examination—he learns in a very practical way preventive medicine in the antepartum and well baby and dietetic clinics.

THE ECONOMIC ASPECT

In this day of changing social conditions, the physician needs to have a clear point of view concerning medical economics. There has been so much loose talk and acrimonious discussion on the part both of uninformed physicians and of uninformed laymen on the subject of medical economics that it is very necessary for the young man entering the profession to know the real facts of the case. There is no better place to obtain first hand information concerning certain phases of medical economics than in a good outpatient department. The central problem of medical economics is how adequate care of the patient may be rendered and paid for. In the outpatient department the student learns the meaning of adequate medical care. He learns what that care costs in the time and effort of the physician and the nurse. He learns something of the accessory costs of medical care, including nursing service, drugs, laboratory procedures and hospitalization. He learns the attitude of the man in the street toward the physician and how little or how much the average person appreciates the time and effort expended by the physician. He learns the attitude of the average man toward the physician's charges, and above all he learns that in any plan for medical care the physician must be the central figure to whom all other instrumentalities are merely subsidiary. It is the doctor who must be the captain of the ship, however necessary the engineers and stewards may be. Through information obtained in the clinic directly from the patient or from the social service worker, the student learns the more remote but far reaching effects of disease on the patient's whole life and outlook. He learns that the cost of illness cannot be budgeted by the individual and that serious illness in the case of the person in moderate circumstances may mean financial ruin or the acceptance of charity.

The student learns that a well organized clinic can give adequate medical care with very great economy of operation, and he cannot fail to realize that, the more the overhead costs of rendering medical service can be reduced, the easier it becomes for the public to pay its bill for health service and at the same time to render to the physician the rewards to which he is justly entitled.

EDUCATION OF THE COMMUNITY

The outpatient department serves to educate not only the medical student, the nurse, the general practitioner, the specialist and the social service worker but also the public. Through outpatient departments the public learns the meaning of adequate medical care, and having once learned this it will not be satisfied with less. Well organized clinics invariably raise the standards of medical practice in the community. The fear has been expressed that patients who, as the result of the financial depression, have been forced to seek medical relief in clinics will, with the return of better economic conditions, be unwilling to return to their family physicians; that is, that they will have become "clinic minded." The physician who has been rendering adequate health service to his patients need have no fear. His patients will return, for in their minds he can never be replaced by the clinic. On the other hand, the patient who has not previously received adequate service may learn for the first time that such is the case, and in this instance it is not the clinic but the physician who is to blame.

General education of the community as to the meaning of adequate medical care can in the long run have only a good effect. When the public learns that adequate medical care is worth while, the public will demand it and will be willing to pay for it. The medical profession has always been willing to render that service and has never been better prepared to do so.

500 South Kingshighway Boulevard.

V 106
1936

IS ANESTHESIA BEING NEGLECTED IN THE MEDICAL CURRICULUM?

RESULTS OF A SURVEY

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I made a survey of the medical colleges of the United States in an effort to determine the hours of instruction, both theoretical and practical, given medical students during their four years of work. It was felt that such information might be enlightening in its relation to the controversy of nurse versus professional anesthesia. The questionnaire, which was sent to the deans of the seventy-four accredited medical colleges of the United States, received fifty-seven replies. As seven colleges have a medical curriculum of only two years, fifty replies were available for the survey.

Is there a course in anesthesia for the students? was the first question. Forty-five affirmative and five negative answers were received. The number of hours of theoretical instruction varied from four to sixty hours (in one college), averaging 10.8 hours or, excluding the college with sixty hours, 9.3 hours. The number of hours of practical demonstration varied from none to 150 hours, the average being indeterminable. Three colleges give no practical demonstration.

Is there a department of anesthesia in, or affiliated with, your college? was the second question and received ten affirmative and forty negative replies.

If not, which department supervises instruction in anesthesia? was the third question. The surgical department supervises instruction in thirty-six and the department of pharmacology in four colleges.

In analyzing this survey it is obvious that despite the inclusion of lectures in anesthesia to the students there is a wide variation in the amount of time devoted, with an average of about ten hours given to the entire subject of anesthesia. Furthermore, it is inconceivable that in five medical colleges there is no instruction in anesthesia. With regard to practical demonstration, the extremes are even more marked. Again it is inconceivable that anesthesia is entirely neglected or given only a meager amount of time in the medical curriculum. The summation of the replies to the second question may throw some light on the reason for this neglect. In only ten of the colleges that replied are there departments of anesthesia as a distinct and separate unit. To me, this survey indicates a deplorable inadequacy of training in anesthesia for the medical students.

Why should anesthesia be ignored in the medical curriculum? Anesthesia today requires careful, comprehensive training to afford the patient the maximum benefit of the advances made in anesthesia during the past fifteen years. Why should patients have excellent surgical care and doubtful care from the standpoint of anesthesia? Is it not unfortunate that Dr. Lundy of the Mayo Clinic, in an address to the anesthesia section, must speak of the inexperienced and occasional users of anesthetic agents?

In addition to the inadequacy of training in the medical schools, the facilities for postgraduate training are limited. In a recent issue of THE JOURNAL the number of hospitals approved for residency in anesthesia numbered six. The total number of approved residencies numbered eight. Such a small number certainly indicates either a lack of interest in anesthesia which is tragic or a disregard by the medical profession of the importance of training in anesthesia. Without well established anesthetic services in the hospitals there is no incentive to the younger graduates to go into a field of medicine that requires just as distinct and well defined training as any other specialized branch of medicine.

I was astonished at the situation evident in this survey and feel that the profession as a whole should be cognizant of the sad neglect of a branch of medicine that is so widely practiced and which so rightfully belongs within the bounds of the medical profession.

It is hoped that this survey may be instrumental in stimulating a renaissance of the instruction in anesthesia in our colleges and hospitals.

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From the Department of Anesthesia and Gas Therapy, the Jewish Hospital.

THE LABORATORY OF PATHOLOGY IN THE SMALL HOSPITAL

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In order to provide proper care for the patients, the smaller hospitals must offer an adequate laboratory service. If the attempt were made to provide all the special features of the laboratories of the larger hospitals, the expense would be out of proportion to the total budget for operation of the hospital. The cost per patient would be higher than in the larger institutions, for exclusive of endowments the cost of the laboratory work is borne by the patients, whether on a flat rate basis or on the basis of payments for each test. Nevertheless professional standards demand that the patient in the small hospital be given care at least equal to that provided in the larger hospital.

The features may be discussed from the point of view of physical plant and personnel. In this paper the major attention is paid to the latter. The amount of space to be allotted for the laboratory depends in certain measure on the amount and variety of work contemplated. In the life of a hospital plant the space originally assigned is usually smaller than what is ultimately required.[1] If the original amount of space should be too small, the cost of its enlargement may well prove to be a source of embarrassment. An estimate of the needs for a general hospital is in the neighborhood of 2,000 square feet of laboratory space for each 100 beds. If the proportion of maternity beds and bassinets is large, this figure may be somewhat high. If the medical and surgical services show a rapid turnover, the figure is low rather than high. Although the establishment of a laboratory service in a small hospital may seem amply provided for at the start with an amount of space less than that indicated, the work, when well done, usually increases rapidly in volume, and expansion of space is soon necessary. Work in a laboratory is not entirely dependent on floor

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1. This may be interpreted as an adverse criticism of hospital architects. In the long experience of the author, the criticism is justified. There are no records of too much laboratory space in the original design of a hospital and many of too little.

area, but wherever possible provision should be made for about 2,500 or 3,000 square feet for the first 100 or 150 beds, to which should be added 2,000 square feet for each additional 100 beds. Inability to provide this much space should not discourage a small hospital from the inauguration of laboratory service. Nevertheless every effort should be made to avoid cramped quarters. Location is another item of importance, because light and ventilation are essential. Basements are for various utilities, which do not include laboratories unless ample light and ventilation can be provided. Upper floors are far more suitable. Excellent laboratory work has been done in dark, inaccessible, cramped and poorly ventilated spaces, but precise laboratory tests have become essential to the best type of medical practice, and the physical plant should give every possible advantage to the laboratory workers. Pasteur did his early experiments in an attic and never required a palace, but when given the opportunity had a workshop with all the conveniences available at the time. The modern hospital laboratory worker is no Pasteur,[2] but his examinations require more exactitude than any of the earlier biologic work of that giant of science.

The equipment should provide for the more common and less complicated examinations. Thus it is necessary to make provision for the qualitative examinations of urine, blood, gastric contents and feces, as well as several of the less complex quantitative tests. If at all possible, provision should be made for the immediate chemical examination of the blood for carbon dioxide combining power, total nitrogen and sugar content. Blood typing and simpler bacteriologic tests are essential. Most hospitals with any considerable surgical service require equipment for the preparation of material for histologic examination. The autopsy service necessitates a complete equipment of instruments, table and plumbing. There are certain tests which, because of complexity, need for special apparatus and technical skill, and lack of urgency in report, may be delegated or "farmed out." These include, for example, certain blood chemical tests such as those for plasma proteins. Although often urgent, it may be necessary to delegate the various toxicologic determinations both qualitative and quantitative. Decision as to whether or not the complement fixation or other tests for syphilis shall be performed in a small hospital laboratory is often difficult. It must be decided on consideration of the training of the technician and the unit cost. It is almost certainly uneconomical to perform the Wassermann tests unless there are about 200 a week to be done. The factor of cost plays a much smaller part in the various precipitation tests for syphilis, but here the experience and training of the technician and the adequate control of antigen preparation are of the highest importance and it is certain that, unless the right technical service is available, even these tests should be delegated. It may be necessary, if animal quarters cannot be provided, to delegate hormone tests such as the Aschheim-Zondek or Friedman test. These may be urgent, as for example in suspected extra-uterine pregnancy, but, if the place to which they are assigned is not too remote, the delay may not be significant.

The personnel of the laboratory includes a director, house staff, technicians, and in some instances a record clerk.

It is common practice in some of the smaller hospitals to place the ward laboratory service in the hands of technicians. This appears to be due to a feeling on the part of the visitants that the work is better done in this way, and to a certain reluctance on the part of the house officers to perform this duty. Although in the past the first of these two reasons may have been good, that time has passed. Graduates of modern medical schools have invariably been well trained in the routine examination of urine, blood, gastric contents and feces. They enter a hospital for the purpose of adding practical experience and closely supervised responsibility for patients to the groundwork provided by the medical schools. It is my considered opinion that a significant part of this postgraduate period should be practice and experience with these laboratory examinations, examinations that are the daily habit of the conscientious practitioner. The hospital that utilizes the technician for this purpose is delinquent in its duty to the house officers.[3] The house officers who in their first year or two of hospital training insist on having these tests performed by a technician neglect a real opportunity. They are required to make the examinations in most of the larger hospitals and should be so required in the smaller hospitals. The fact that this provision in the smaller hospitals would relieve the technician for more work of other types is only incidental and has no bearing on the educational principles involved.

The number of technicians to be employed depends on the size and character of the hospital and the volume of work required. If laboratory work is to be done at all, one technician at the least is required. It may be that the one technician can be so trained as to care for the ordinary routine of the clinical laboratory, as well as the radiologic and electrocardiographic departments. In no case, however, should the technician be so overloaded with work as to necessitate hasty examinations or be required to do things for which he or she is not fully trained and competent. The expense of adequate technical service is never an extravagance.

The most important item is the selection of a director of the laboratory. The problem of the smaller hospital is as to how the services of a well trained, experienced, competent pathologist can be obtained for this service at a cost which is not prohibitive. A small hospital may be so well endowed that it can afford a rate of pay attractive to a competent person, but unless it is large enough to provide material to occupy him and can support something in the way of a research program, the post will have no appeal to any but one who is satisfied to be a hired man.[4] It is possible that a hospital may be so remote from the medical center that it could not participate in a plan similar to that to be outlined, but with modern communications [5] such an instance would be unusual. With few exceptions, it is probable that it is uneconomical for a general hospital of less than 250 or 300 beds to provide for the full time service of a competent director of laboratories. The problem, then, is as to how best to arrange for a part time director who will compare favorably with the director in the larger hospitals. It is of course possible for one person to serve several smaller hospitals. Often enough,

2. This may underestimate the genius of some contemporaries. In the event of this remote possibility, the author offers his apologies.

3. The implications of this bald statement are humbly drawn to the attention of the Council on Medical Education and Hospitals.

4. This is a generalization that may have exceptions in periods of economic distress.

5. Pathology is a hazardous occupation even when cloistered. Thus the addition of the traffic hazard seems proportionately of little significance.

V 106
1936

this means that not one of the hospitals has a large laboratory of the first class. If, however, he is connected with one high grade, amply equipped and fully manned laboratory, a satisfactory arrangement can be consummated. In this sense the laboratories of the smaller hospitals can be satellites to the sun of the larger institutions. That this arrangement is practicable is shown by experience in Cleveland and in certain other cities. In that city there are two such solar systems, the larger centered in the Institute of Pathology.[6] The institute, a part of Western Reserve University and its school of medicine, serves as a central laboratory for the university hospitals. The training given the assistants can thus be on a broad basis. In addition to the autopsy work and all varieties of surgical pathology, training is afforded in bacteriology, immunology, biochemistry and other routine. The institute furnishes, for part time service as laboratory directors in the smaller hospitals, men who have been given this well rounded training for three years or more after having had clinical internship. The amount of time to be given by the pathologists is settled after conferences between the hospital authorities and the director of the institute. The salary paid depends on the time required and the experience of the pathologist. Payment to the pathologist on the basis of number of examinations has been avoided so far. It is believed that if such a basis were adopted there might be some restriction on the examinations requested by the clinician, which at times might be detrimental to the best interests of the patient. For this reason the recommendation is made to the hospital that the cost of private accommodations be so adjusted that it includes the usual laboratory routine. Experience so far has shown that by this method the laboratory has not been exploited, except in a few rare instances. When this occurs, a conference between the hospital executive and the offending physician has resulted in understanding and cooperation. How far this principle may be applied to radiologic and electrocardiographic service differs with various hospitals.[7]

The time necessary for the work of the different hospitals varies. In one hospital, three visits a week are required. In another, the pathologist is present all of every morning. In two others, he visits every week and in still another he visits every two weeks. In the latter instances, specimens regarded as urgent in the intervals are sent to the institute.

The arrangement as it concerns the personnel of the institute varies. In one case, a senior assistant visits every week and has an assistant on the clinical staff of the hospital, not rated as a pathologist or even assistant pathologist, who "cuts in" surgical material and delivers the sections to the institute. Diagnoses are made solely by the pathologist. The weekly visits have to do principally with guidance of the technician and consultation with the staff.

Another senior assistant pursues the same general method with a hospital, which he visits every two weeks, except that in this case there is no assistant other than a highly trained experienced technician.

An intermediate assistant makes short visits three times a week to two hospitals and once a week to a third hospital.

Another intermediate assistant, somewhat junior to the one just noted, is on duty at one hospital all of every morning. For this service he is paid at a higher rate by the individual hospital than is true of the others.

It is apparent that the two senior assistants render their outside hospital service with practically no sacrifice to the work for which they are primarily employed. The first of the intermediates gives about half his time, somewhat irregularly distributed, to the university and the university hospitals, for which he is paid a small stipend. The more junior of the intermediates gives his afternoons to the university and the university hospitals. This is considered to be by far the less desirable half of the day, and his stipend is in the form of maintenance.

Although the contracts are made between individuals and hospitals, the arrangements are made with the director of the institute and in certain measure are under his control.

The hospitals so served are about 2, 6, 6, 6, 20 and 40 miles from the institute. The hospital 20 miles distant is visited once a week and the one 40 miles distant once every two weeks.

The advantages to the smaller hospitals by this arrangement are several. The director of the institute guarantees to provide a well trained and competent pathologist. This person has the backing and professional support and advice of the personnel of the institute. In case of difficulties he can immediately consult with any one of the four seniors, who have had many years of experience in pathology, bacteriology, immunology and biochemistry. The number of persons at the institute is such that in the absence of any one of the small hospitals' pathologists, either by illness or by vacation, his work can be carried on by one of the others. Thus the hospital work is covered at all times. This does not mean that always the visits to the hospitals are uninterrupted, but it does mean that diagnoses can be given at once.

The salary paid by each of the smaller hospitals is insufficient to pay a pathologist for full time service except in one instance, in which the amount would support a meager existence. This hospital, if it were not for the institute association, would be obliged to have as its pathologist a person inadequately trained for the responsibilities entailed and probably unsuited for connection with the larger institution. His chances for advancement in his field would be circumscribed by the necessity for self training and by a lack of opportunity for research. The part time given to the institute affords constant supervision in further building up of experience and training, ample consultation with older and fully competent pathologists, attendance on the weekly staff conferences, access to an excellent library, and favorable conditions for original investigation. The advantages to the institute lie in the provision of part time service of several workers who could not otherwise be held, as well as augmentation of wealth of material. Two spheres of influence are thus created, one in the university hospitals and those closely affiliated with the university, and the other in the smaller hospitals through the medium of their laboratories. It is believed that the insistence on precision, the constant interchange of views and the critical atmosphere of the institute are of educational and inspirational value in these spheres.

6. The other, smaller in volume but with a hot sun and powerful gravitational force, is centered in the Mount Sinai Hospital Laboratory directed by Dr. Benjamin S. Kline.

7. It is believed that the general plan here outlined is suitable also for roentgenology in the small hospital. It is difficult for the author to believe that a good roentgenologist can be at the same time a competent pathologist, but he freely admits that it is almost as difficult for a good pathologist to be a competent roentgenologist. The precision of modern medicine cannot be harmonized with the combination of these two offices in one person.

The university hospitals routine in the institute is paid for by those hospitals. The director of administration of the university hospitals, by virtue of his sense of community responsibility and interhospital courtesy, has approved a plan whereby special tests, for which the smaller hospitals are not equipped, may be performed at the institute. Thus, uncommon biochemical tests, toxicologic tests, biologic tests, bacteriologic identification, immunologic studies, special stains and the like may be absorbed in the routine of the institute, without significant addition to its cost of operation. It is understood that so long as such tests are occasional the institute makes no charge. If they become frequent, a decision will have to be made as to whether the smaller hospital equips for them or pays the institute the approximate cost.

It will readily be seen that this principle provides for a complete laboratory service to the smaller hospitals. The application of the principle must vary in the separate instances with the particular needs to be met. The hospital has not available at all times the immediate service of a pathologist, but in all cases the pathologist holds himself ready to respond to emergencies and to perform such autopsies as must be done at times when he is not regularly at the hospital. The plan is adaptable to a wide variety of circumstances and furnishes laboratory service of the highest grade, suitable to the requirements of the hospital and to its purse. Its patients can be studied with thoroughness and precision. In practice over several years, the plan has been found to be satisfactory to the smaller hospitals and to the institute.

It is to be emphasized that this plan is established to provide for the smaller hospitals professional pathologists rather than to secure part time assistants for the larger central laboratory. It does not solicit part time service for the university work.[8] On the contrary, the centrum is the university laboratory and there the pathologist has his headquarters.

Potentially the plan has possible disadvantages. From the university point of view there is the danger that the part time assistants so provided may partly replace an instruction staff whose time and principal interest are devoted to academic work. This would undo all that has been accomplished in the building up of full time university personnel. From the small hospital point of view, the successful operation of the plan should not be permitted to interfere with the growth and expansion of the laboratory jointly with that of the hospital, so that as work and funds increase the hospital may have its own pathologist.

8. This should not be interpreted as self righteousness. This department is grateful for the assistance of the pathologists of some of the larger hospitals in teaching and investigation.

Amount of Food Required.—In general it may be said that the food requirement of a young to middle-aged man of average size without muscular work or physical exercise, eating a mixed diet sufficient to meet his need, approximates 2,000 calories per day, and that such muscular activity as is incidental to very quiet living indoors may be expected to raise this requirement to about 2,200 calories per day. These estimates are for a normal man of average size, weighing (without clothing) 70 kilograms, or 154 pounds. Larger or smaller normal men will require more or less, approximately in proportion to their weight when other conditions are uniform. Women average about four-fifths the weight of men and because of this difference in size they spend about four-fifths as much energy for like activity.—Sherman, H. C.: Food and Health, New York, Macmillan Company, 1934.

THE BLOOD IN ARTHRITIS

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During the last three years at the arthritis clinic of the New York Post-Graduate Hospital we have made various blood studies in chronic arthritis. Most of these data have been published in full elsewhere, but a summary and correlation of the material is timely. It may be said that as yet not one of the conditions found by any method of blood examination can be said to be entirely diagnostic. The cause of arthritis is still unsettled. Nevertheless we feel that some of the results summarized here are suggestive contributions to the solution of the arthritis problem. The distinction is continually made between rheumatoid arthritis and osteo-arthritis. It is generally, although not universally, conceded now that they represent two distinct disease entities.

Most of the usual blood analyses, such as the routine chemical examination of the blood, have been found normal by many investigators as well as by ourselves. These negative results are not recorded here. The sedimentation rate of the erythrocytes is likewise not discussed, except in relation to the serum protein studies, because this field has been well covered elsewhere in many publications.

TABLE 1.—*Summary of Abnormal Nonfilament Counts*

	Rheumatoid Arthritis			Osteo-Arthritis		
	Number of Patients	Patients Abnormal	Average Count, per Cent	Number of Patients	Patients Abnormal	Average Count, per Cent
Average for entire series	100	95	29.6	100	55	21.6

FILAMENT-NONFILAMENT COUNT IN CHRONIC ARTHRITIS[1]

The ordinary total white cell and differential counts have been found largely normal in arthritis by many investigators. We obtained similar results in forty-six patients with rheumatoid arthritis, of whom thirty-six, or 80 per cent, showed total white blood cell counts between 5,000 and 10,000 cells per cubic millimeter, while the average differential count of polymorphonuclear neutrophils was 64 per cent. Almost identical figures were obtained by us in a group with osteo-arthritis. Further analysis of the blood cytology by special methods, however, shows abnormal changes in the leukocyte picture in arthritis.

Schilling's modification of the Arneth count has until recently received little attention in chronic arthritis. A number of workers here and abroad are in agreement that the Schilling hemogram indicates a "shift to the left" as a characteristic of rheumatoid arthritis in at least the greater number of patients reported.

A simplification of Schilling's method, wherein the polymorphonuclear neutrophils are divided into only

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From the Arthritis Clinic of the New York Post-Graduate Medical School and Hospital, Columbia University.

1. Steinbrocher, Otto, and Hartung, E. F.: The Filament-Nonfilament Count in Chronic Arthritis, J. A. M. A. 100:654-656 (March 4) 1933.

V 106
1936

two groups, nonfilamented and filamented, is becoming increasingly utilized and has been employed by us in the study of the leukocytes in chronic arthritis. The first group, or the nonfilamented cells, consists of the young neutrophils in which the nuclei are unsegmented or, if segmented, the nuclear parts are still joined by thick portions of nuclear material. The second group, or filamented cells, consists of those neutrophils in which a fine filament of chromatin material connects two or more segments of the nucleus; i. e., the true polymorphonuclear cells.

TABLE 2.—*Serum Calcium*

Type of Case	Number of Cases	Mg. per 100 Cc. Mean	Probable Error of Mean	Standard Deviation	Probable Error of Standard Deviation
Control (Greene and Boothby)	852	10.341	±0.015	0.447	0.010
Rheumatoid arthritis	50	10.218	±0.097	0.699	0.069
Osteo-arthritis	50	9.986	±0.859	0.616	0.042

We have found that the nonfilament count in 100 patients with rheumatoid arthritis was elevated in ninety-six patients, while in a group of 100 osteo-arthritic patients the count was above normal in fifty-three. The average nonfilament count in the rheumatoid group was 29.6 per cent, and in the osteo-arthritic patients with elevated counts the average was 21.6 per cent. The normal count is considered to be 16 per cent. Table 1 gives a summary of our results.

The high incidence of an elevated nonfilament count in rheumatoid arthritis suggests the presence of an infectious agent in this disease. The elevated nonfilament count in slightly over half of the patients with osteo-arthritis is worthy of comment. These abnormal conditions in osteo-arthritis may be due to associated rheumatoid disease or focal infection.

The filament-nonfilament count, we find, is a simple aid in differentiating rheumatoid arthritis and osteo-arthritis when within normal limits. A normal count indicates that rheumatoid arthritis is not present. An elevated count may indicate the presence of rheumatoid arthritis, mixed arthritis or osteo-arthritis with focal sepsis.

THE SERUM CALCIUM IN ARTHRITIS [2]

In rheumatoid or atrophic arthritis there is a general decalcification and rarefaction of the bones involved. This is most marked at the epiphysis, but the cortex of the shaft is involved as well. In osteo-arthritis or hypertrophic arthritis the process of decalcification is not so marked. There are characteristic cysts at the chondro-osseous junctions and a simultaneous deposition of new bone which produces eburnation at the areas denuded of cartilage, and calcified excrescences at the edges of the epiphysis. Most pathologists now consider that the fundamental and initial lesion in osteo-arthritis is an erosion of articular cartilage and that the calcified excrescences are secondary and perhaps compensatory in character.

So far, attempts to study the calcium balance in arthritis have produced negative results. Arthritis is a chronic disease and the disturbance in the calcium metabolism would probably be too small to demonstrate conclusively in a balance experiment of a few days' duration. That there is, however, a disturbance in the calcium metabolism is indisputable.

Many attempts have been made to study serum calcium in arthritis. The technic for the determination of serum calcium is especially liable to technical error. The resulting marked variations in the results have led to confusion on this subject.

One of us together with Carl H. Greene studied fifty typical cases of rheumatoid arthritis and a like number of cases of osteo-arthritis, for the determination of the serum calcium. The Clark-Collip modification of the Kramer-Tisdall method was used. The analyses were all done in one laboratory.

The usually accepted normal range for the serum calcium is between 9 and 11 mg. per hundred cubic centimeters. We used as our control group 852 cases reported by Greene and Boothby of the Mayo Clinic. Table 2 gives a summary of our results.

Thus we see that the values for the mean and the standard deviation of the serum calcium in a group of fifty cases of rheumatoid arthritis were 10.218 ± 0.699 mg. per hundred cubic centimeters. These values were essentially the same as those found in the control group.

The values for the mean and the standard deviation of the serum calcium in a group of fifty cases of osteo-arthritis were 9.986 ± 0.616 mg. per hundred cubic centimeters. The changes in the serum calcium in any individual case of osteo-arthritis are perhaps without direct clinical significance, but the trend in the group represents a statistically significant reduction in the mean calcium level. The reason for this change is not obvious. Its presence in osteo-arthritis and absence in rheumatoid arthritis are further evidences that these two conditions represent separate clinical entities.

This study of the serum calcium furnishes no evidence that the hyperactivity of the parathyroid glands is a factor in the production of arthritis.

THE CHOLESTEROL CONTENT OF THE PLASMA IN ARTHRITIS [3]

There are very few reported studies of the cholesterol metabolism in arthritis. The present investigation, carried out by Maurice Bruger and one of us, includes a study and statistical analysis of the cholesterol partition in the plasma in ninety-two cases of arthritis.

TABLE 3.—*Total Cholesterol Content of the Plasma*

Group	Number of Observations	Arithmetic Mean, Mg. per 100 Cc.	Standard Deviation	Probable Error of Mean	d / σ D
Normal	33	194.7	29.3	3.42	0.0
Rheumatoid arthritis	39	173.2	39.5	4.69	2.27
Osteo-arthritis	39	205.4	45.1	3.69	3.39

Only typical cases of rheumatoid arthritis and osteo-arthritis were selected. In all the duration of the disease varied from three months to ten years. The blood specimens were obtained by venipuncture, usually after breakfast. Free and ester cholesterol were determined by the Bloor-Knudson method.

The plasma cholesterol in subjects with arthritis were compared with cholesterol studied in thirty-three normal subjects, all determinations being carried out under identical conditions in the same laboratory. Table 3 shows the results in thirty-three cases of rheumatoid arthritis and fifty-nine cases of osteo-arthritis, together with thirty-three normal subjects.

2. Hartung, E. F., and Greene, C. H.: The Serum Calcium in Arthritis, J. Lab. & Clin. Med. 20:929 (June) 1935.

3. Hartung, E. F., and Bruger, Maurice: The Cholesterol Content of the Plasma in Arthritis, J. Lab. & Clin. Med. 20:675 (April) 1935.

In the rheumatoid group the average age was 39 years; 63 per cent of the patients were females. The mean total cholesterol was 175.2 ± 39.5 mg. per hundred cubic centimeters of plasma. In the osteo-arthritis group the average age was 51 years; 90 per cent of the patients were females. The mean total cholesterol was 235.4 ± 45 mg. per hundred cubic centimeters of plasma. The cholesterol esters in both groups showed a normal relation to the total cholesterol.

TABLE 4.—*Serum Protein Determinations in Osteo-Arthritis*

Name	Total Protein	Albumin	Globulin	Ratio	Fibrinogen	Pseudo I	Pseudo II	Euglobulin	Sedimentation Rate
F. G.	6.75	4.25	2.51	1.69	0.29	1.39	0.57	0.44	5
F. S.	6.29	4.05	2.24	1.8	0.23	1.09	0.56	0.45	..
J. H.	7.08	4.42	2.61	1.69	....	1.39	0.41	0.81	..
D. K.	6.62	4.04	2.58	1.75	0.27	1.76	0.45	0.63	55
M. R.	6.90	4.34	2.56	1.70	0.32	1.28	0.54	0.42	45
M. K.	6.57	4.06	2.51	1.62	0.13	2.27		0.11	..
N. D.	6.85	4.29	2.56	1.68	0.42	1.25	0.59	0.30	30
C. H.	7.17	4.61	2.56	1.83	0.45	1.86		0.25	20
H. M.	7.30	4.65	2.65	1.59	0.35	1.60	0.45	0.54	10
I. S.	6.54	4.08	2.46	1.66	0.56	1.08	0.56	0.30	15
S. B.	7.29	4.58	2.63	1.4	0.46	1.44	0.62	0.45	31
M. S.	6.69	4.34	2.35	1.85	0.32	1.19	0.54	0.21	10
A. S.	7.38	4.80	2.48	1.93	0.29	1.26	0.48	0.45	25
E. K.	7.25	4.54	2.71	1.67	0.50	1.14	0.69	0.02	85
Average	7.02	4.42	2.60	1.71	0.33	1.32	0.54	0.39	30

The observations recorded in this study that patients with rheumatoid arthritis tend to show a low blood cholesterol support the infectious theory of its etiology, since other acute infections are accompanied by a hypocholesterolemia. The tendency to an elevated blood cholesterol in osteo-arthritis, on the other hand, suggests the degenerative origin of this disease, since other degenerative diseases are usually accompanied by hypercholesterolemia.

These results show that the plasma cholesterol tends to be low in rheumatoid arthritis and high in osteo-arthritis. That these results, especially those obtained in the osteo-arthritis group, are really significant is evident from the statistical analysis; the difference between the means of the normal group and the rheumatoid group divided by the standard error of the difference of these means gives a value of 2.27. This variation from normal is suggestive but not definite. The same calculations applied to the normal and the osteo-arthritis group show a figure of 5.20, indicating a significant variation from normal.

Two explanations for the latter finding may be suggested: first, that patients with osteo-arthritis are obese; second, that they fall in an older age group. It has been shown, however, by Bruger and Poindexter [4] that uncomplicated obesity is associated with a normal plasma cholesterol. Also there are few studies in the literature which point to an increased blood cholesterol in the aged. Bruger is of the opinion that the factor of age alone in no way influences the level of the blood cholesterol.

PROTEIN STUDIES IN RHEUMATOID ARTHRITIS AND OSTEO-ARTHRITIS [5]

Since the reawakening of interest in the sedimentation rate by Robin Fareus in 1918, there has been an immense amount of clinical and laboratory investigation concerning the chemical changes in the blood which are responsible for this phenomenon. Boots and Dawson [6] first called attention to the difference in sedimentation rate in rheumatoid arthritis as opposed to that in osteo-arthritis. Snapper [7] showed that the power of the red cells to settle at various rates in different diseases was dependent on three factors; i. e., cell volumes, plasma fibrinogen and plasma globulin. It was in order to determine just how these changes take place that this work was undertaken.

The total plasma protein, albumin, globulin, fibrinogen, globulin fraction pseudo I and II and euglobulin and sedimentation rate have been determined on numerous occasions on seventy-nine subjects. The analyses presented here cover only the determinations done on fourteen patients with osteo-arthritis and on sixteen with severe rheumatoid arthritis. The chemical analyses were done by Dr. J. P. Chandler in the department of physiology of the Cornell University Medical College. The method of Howe was used. In table 4 are given the results obtained in the blood studies of fourteen cases of osteo-arthritis. These figures approximate the average normal.

In table 5 are given the results obtained in sixteen cases of severe rheumatoid arthritis. From the study of these tables it can be seen that there is a rise in the globulin fraction and a fall in the albumin fraction in rheumatoid arthritis. The greatest change takes place in the euglobulin. There is very little, if any, change in the protein fraction of those ill with osteo-arthritis. There is usually a rise in the fibrinogen in rheumatoid arthritis but the rise is not as great as that in the globulin. The fibrinogen content of those ill with osteo-arthritis sometimes rises, and this is usually the cause for the rapid sedimentation rate that is occasionally seen in those ill with this type.

Since the changes found in rheumatoid arthritis are characteristic of infection in general, this study gives further evidence indicating that rheumatoid arthritis is an infectious disease while osteo-arthritis is not.

TABLE 5.—*Serum Protein Determinations in Severe Rheumatoid Arthritis*

Name	Total Protein	Albumin	Globulin	Ratio	Fibrinogen	Pseudo I	Pseudo II	Euglobulin	Sedimentation Rate
M. M.	7.84	3.56	3.98	0.89	0.68	1.89	0.69	0.75	..
L. H.	7.22	3.59	3.63	0.99	0.84	1.56	0.71	0.59	125
T. F.	8.15	3.66	4.49	0.82	0.77	2.04	0.68	1.00	65
K.	7.70	3.92	3.78	1.03	0.59	1.79	0.55	0.85	..
O. F.	7.75	3.89	3.86	1.01	0.57	2.49		0.80	97
C. K.	7.85	3.21	4.14	0.77	0.65	2.08	0.65	0.76	..
E. L.	7.90	3.92	4.00	0 97	0.81	2.55		0.70	..
O. O.	6.69	3.32	3.37	0.71	0.58	1.85	0.65	0.71	..
L. H.	8.35	4.08	4.27	0.96	0.45	2.59	0.59	0.85	43
L.	6.73	3.61	3.72	0.81	0.61	1.61	0.80	0.70	120
H. L.	7.84	3.97	3.87	1.02	0.80	1.85	0.69	0.73	..
A. M.	6.84	3.44	3.39	1.07	0.62	1.53	0.53	0.70	..
J. J.	7.74	3.45	4.29	0.80	0.89	1.53	0.69	0.97	..
M. G.	7.35	3.74	3.61	1.04	0.39	1.86	0.69	0.68	104
M. C.	8.12	3.86	4.26	0.91	0.49	2.02	0.76	0.99	65 fever
E. F.	7.32	3.63	3.69	0.98	0.59		2.89	0.61	..
Averages	7.56	3.69	3.86	0.90	0.63	1.81	0.69	0.74	85

AGGLUTININS AND PRECIPITINS IN ARTHRITIS [8]

During the past five years there has been a great deal of interest in the presence or absence of streptococcus agglutinins in the serums of arthritis subjects, especially those suffering with what is commonly called rheumatoid arthritis. The presence of agglutinins for various strains of streptococci is thought by some

4. Bruger, Maurice, and Poindexter, C. A.: Relation of the Plasma Cholesterol to Obesity and to Some of the Complicating Degenerative Diseases (Diabetes Mellitus, Essential Hypertension, Osteo-Arthritis and Arteriosclerosis), Arch. Int. Med. 53:423 (March) 1934.

5. Davis, J. S.: J. Lab. & Clin. Med. 21:478 (Feb.) 1936.

6. Dawson, M. H.; Sia, R. H. P., and Boots, R. H.: Differential Diagnosis of Rheumatoid and Osteo-Arthritis: The Sedimentation Reaction and Its Value, J. Lab. & Clin. Med. 15:1063-1071 (Aug.) 1930.

7. Bendien, W. M.; Neuberg, J., and Snapper, I.: Beitrag zur theorie der Senkungsgeschwindigkeit der roten Bluthörperchen, Biochem. Ztschr. 247:306-321, 1932.

8. To be published.

V 106 1936

workers to be pathognomonic of this form of arthritis. From these workers we are led to conclude that rheumatoid arthritis serums show a high titer of agglutination with certain strains of streptococci, whereas serums from other disease conditions and from normal persons fail to show as high a titer. If this were true, the agglutination test would be a valuable diagnostic aid and these observations would lend support to the theory that streptococci are the etiologic agents in rheumatoid arthritis.

TABLE 6.—*Agglutination Reactions in Rheumatoid Arthritis, Osteo-Arthritis and Normal Conditions*

Number of Patients Tested	Bacterial Antigen Used	Per Cent Negative in All Dilutions			Per Cent Positive in Dilutions 1:160 and Above		
		Rheumatoid Arthritis	Osteo-Arthritis	Normal	Rheumatoid Arthritis	Osteo-Arthritis	Normal
20	AB_{13} Alpha prime streptococcus*	54	100	84	35	0	10
22	AB_{13} (second series)	51	90	..	30	0	..
22	NY_5 Streptococcus haemolyticus†	68	89	..	36	0	..
22	C_{17} Streptococcus haemolyticus†	69	89	..	24	0	..
20	Adamso Strep. haemo. septicemia	54	90	94	14	0	0
22	Throat M Strep. haemo.	69	96	..	6	0	..
22	Stool S alpha streptococcus	75	81	..	6	0	..
20	RB_5 Streptococcus viridans‡	64	62	60	16	6	10
22	RB_5 (second series)	68	68	..	15	12	..
20	Allen Strep. vir. septicemia	80	100	100	4	0	0
22	Clawson Strep. vir.§	81	90	..	0	0	..
22	Clawson Strep. vir.¶	75	81	..	6	0	..

* Isolated, according to R. L. Cwell and his associates, from the blood stream of a patient with rheumatoid arthritis.
† Scarlet fever strain, Dochez.
‡ From the throat of a rheum patient.
§ Isolated by Cwell from the blood of a patient with acute rheumatic fever.
‖ Isolated by B. J. Clawson from a patient with "chronic arthritis."
¶ Isolated by B. J. Clawson from a patient with acute rheumatic fever.

In the appended summary (table 6) of our own observations in this regard we selected three groups: (1) rheumatoid arthritis patients, (2) osteo-arthritis patients and (3) normal controls. The strains used as antigens were all streptococci, the great mass of investigation since the beginning of the century pointing toward the streptococcus as the important etiologic factor. The strains used include organisms isolated by various workers from rheumatoid arthritis and acute rheumatic fever, and from septicemia and other infected sources.

A diffuse growth of streptococci suitable for agglutination tests was obtained. Serum dilutions were made in 0.5 per cent sodium phosphate broth and 0.5 cc. of antigen was added to each dilution, making the total volume 1 cc. in each tube. They were shaken, incubated at 56 C. for two hours and placed in the icebox over night.

If one considers that agglutinations in titers of 1:160 and above are significant, it is seen that rheumatoid arthritis serums agglutinate strains AB_{13} in 36 per cent, NY_5 in 30 per cent, and C_{17} in 24 per cent of the cases in this range of dilution. These are all hemolytic organisms. Using the organisms of cases from fatal septicemias, both Streptococcus haemolyticus and Streptococcus viridans, we obtained agglutinations only in very low titers. In osteo-arthritis serums there was practically no agglutination in any dilution of serum with the hemolytic streptococci. In the normal subjects, with the hemolytic strains, AB_{13} gave agglutinations at 1:160 and above only in 10 per cent of the cases.

We conclude, therefore, that a greater percentage of the serums from patients with rheumatoid arthritis showed agglutinins for streptococci in high titers than from patients with osteo-arthritis or from normal subjects. The streptococci most frequently agglutinated by rheumatoid arthritis serums were of the hemolytic type, Streptococcus viridans being less frequently agglutinated. The agglutinins found in the serums of rheumatoid arthritis patients were not strain specific, more than one strain of hemolytic streptococcus being agglutinated in comparable percentages. Hemolytic streptococci known to have caused death were not as frequently agglutinated as hemolytic strains of a less virulent nature.

Lancefield[9] found that hydrochloric acid extracts of Streptococcus haemolyticus, as prepared by a modification of the Porges method, contain group-specific as well as type-specific substances. In our precipitin studies extracts of NY_5, a hemolytic streptococcus, were used as antigens. The hydrochloric acid extract contained principally the group-specific carbohydrate as well as the type-specific protein M. This hydrochloric acid extract was further processed by alcoholic precipitation with sodium acetate, to eliminate all but the type specific protein M. Both these extracts were used as antigens in parallel tests and gave nearly identical results.

Parallel agglutinin and precipitin reactions were then run on the same serums. Table 7 gives our results in summary. Here again only the rheumatoid arthritis serums contained agglutinins and precipitins in significant titers. It is seen that the results of agglutinin and precipitin tests are practically identical. The trend of this work tends to show that rheumatoid arthritis serums show a higher titer of agglutinins and precipitins with certain strains of streptococci than the serums from patients with other disease conditions and from normal subjects. This finding lends support to the theory that hemolytic streptococci are the etiologic agents in rheumatoid arthritis.

TABLE 7.—*Streptococcus Agglutinations and Precipitin Reactions in the Serum of Patients with Arthritis and of Normal Subjects*

		Rheumatoid Arthritis, 25 Cases	Osteo-Arthritis, 21 Cases	Normal, 22 Cases
Agglutinins*	positive†	42%	0	0
Precipitins‡	positive§			
Agglutinins	negative	44%	90%	100%
Precipitins	negative			
Agglutinins	positive	7%	0	0
Precipitins	negative			
Agglutinins	negative	12%	10%	0
Precipitins	positive			

* Suspension of Streptococcus haemolyticus NY_5 used as antigen.
† A serum was considered positive when agglutination occurred in dilutions of 1:160 and above.
‡ Hydrochloric acid extract of Strep. haemo. NY_5 used as antigen.
§ A serum was considered positive when a marked precipitation occurred in any dilution.

SUMMARY

Rheumatoid arthritis is now generally accepted as a disease of bacterial origin. Until recently this opinion has been based mainly on clinical impression. Many of the observations here summarized, however, add laboratory data to support this assumption. The ele-

9. Lancefield, Rebecca C.: The Antigenic Complex of Streptococcus Haemolyticus, J. Exper. Med. 47: 91-103 (Jan.) 1928.

vation of nonfilamented or young polyneutrophils, the lowered plasma cholesterol, and the rise in the serum globulin and fall in the albumin fraction all point to the infectious origin of rheumatoid arthritis. The high agglutinin content of the serum for Streptococcus haemolyticus, supported by the positive precipitin tests when fractions of this organism are used, suggests that the infecting organism may be Streptococcus haemolyticus.

Osteo-arthritis, on the other hand, has long been considered a degenerative disease. The finding of a normal nonfilament percentage in many cases of osteo-arthritis certainly suggests that infection plays no part in this condition; likewise the fact that the albumin-globulin ratio is not altered. The high plasma cholesterol lends positive support to the degenerative theory. The absence of agglutinins and precipitins in the serum in those cases suggests that at least the streptococci play no part in this form of arthritis.

It has also been shown that there is a normal serum calcium in rheumatoid arthritis. The slight lowering of the serum calcium in osteo-arthritis remains unexplained.

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TREATMENT OF GASTRODUODENAL ULCER WITH HISTIDINE MONOHYDROCHLORIDE (LAROSTIDIN)

DAVID J. SANDWEISS, M.D.
DETROIT

Peptic ulcer constitutes a major problem in medicine. Relatively little is known concerning its etiology and prevention. Symptoms as a rule recur frequently. Medical management is unsatisfactory in a large number of cases. Though the diet-alkali-antispasmodic regimen offers relief to a large percentage of patients, not infrequently, because symptoms continue to recur, the chronic callous ulcer forms with its resultant complications. Surgical treatment is also unsatisfactory. Recurrence of ulcer after operation and gastrojejunal ulcers are not uncommon.

Always alert for a more satisfactory treatment of peptic ulcer, both physicians and patients are not unwilling to try "newer" methods of treatment. Many have been reported in the literature. Chief of the parenteral methods of treatment are vaccineurin,[1] novoprotein,[2] aolan,[3] various strains of organisms and vaccines,[4] pepsin,[5] sodium benzoate,[6] emetine hydrochloride,[7] hemoprotein,[8] sodium citrate and sodium chloride,[9] parathyroid extract,[10] insulin[11] and histidine monohydrochloride.[12] The most important of the nonparenteral "new" methods of ulcer therapy are metaphen,[13] aluminum hydroxide,[14] mucin,[15] powdered okra,[16] and the latest but by no means the last, "river sand" or silicon dioxide.[17]

The "amino acid histidine monohydrochloride" (b-imidazole a-amino monohydrochloride propionic acid) or the so-called LaRostidin brand histidine (Hoffman-LaRoche) is the most widely advertised product in the treatment of gastroduodenal ulcer at present. The manufacturers state that "as the treatment progresses the physician may usually note the following sequence of events: (*a*) After 4-5 injections pain disappears and does not recur. Physical and functional symptoms are relieved. (*b*) After 10 days or so, a normal diet is well tolerated and appetite increased. There is gain in weight together with general systemic improvement. (*c*) After about three weeks of continued injections, radiologic findings become negative and the patient is found clinically well."

The Council on Pharmacy and Chemistry of the American Medical Association[18] reports in part as follows: "The preparation has not been submitted to the Council on Pharmacy and Chemistry nor has the Council recognized any histidine preparation for the treatment of ulcers."

SUMMARY OF EXPERIMENTAL BACKGROUND FOR HISTIDINE THERAPY IN PEPTIC ULCER

Exalto[19] was the first to produce peptic ulcers in dogs identical with those observed in man. His experiments, however, were few and his work was unrecognized for years until Mann and Williamson[20] reported their results. Later Mann and Bollman[21] reported a large series of experiments and described the operation (usually described as surgical drainage of the duodenum) and results as follows:

> The pylorus was sectioned and the distal end inverted, the jejunum was transected a few centimeters distal to the ligament of Treitz, the distal end was anastomosed to the pylorus, and the proximal end was anastomosed to the ileum from 30 to 60 cm. from the termination of the latter. These procedures caused the gastric contents to be expelled from the stomach into the jejunum without becoming mixed with the secretions poured into the duodenum (the bile, the pancreatic juice and the duodenal juice) which are drained into the ileum. Furthermore, the possible protective mechanism of the duodenal mucosa was eliminated by the substitution of jejunal mucosa. This

The histidine monohydrochloride (LaRostidin) was supplied by Hoffman LaRoche, Inc.

From the gastro-intestinal department of the North End Clinic and the outpatient department of Harper Hospital.

1. Heller, G.: Protein Therapy of Stomach Ulcer, Arch. f. Verdauungskr. **29**: 123-148 (Feb.) 1922.
2. Pribram, B. O.: Protein Therapy of Gastric Ulcer, Med. Klin. **18**: 958-962 (July 23) 1922.
3. Martin, L.: Peptic Ulcer: Effect of Parenteral Injections of Purified Milk Proteins on Symptoms and Progress, Arch. Int. Med. **45**: 299-325 (March) 1929.
4. Meyer, J., and Karteon, L. B.: Effects of Intravenous Injections of Foreign Protein on Peptic Ulcer, Arch. Int. Med. **46**: 768-777 (Nov.) 1930. Vanzant, F. R.: Effect of Injection of Nonspecific Protein on Pain of Ulcer and on Gastric Secretion, Proc. Staff Meet., Mayo Clin. **6**: 745-747 (Dec. 16) 1931. Roux, J. C., and Girault: Treatment of Peptic Ulcer by Vaccination, Arch. d. mal. de l'app. digestif. **15**: 949-954 (Nov.) 1925. Acosta, R.: Vaccine Therapy in Gastric Ulcer, Semana méd. **1**: 1218-1220 (June 4) 1925. Billaud, C.: Ulcère la petite courbure traité par la vaccinothérapie, Arch. d. mal. de l'app. digestif. **16**: 1121-1125 (Dec.) 1926. Sandweiss, D. J., and Meyers, S. G.: Treatment of Peptic Ulcer with Bacterial Vaccines (Foreign Protein), Am. J. Digest. Dis. & Nutrition **1**: 338-341 (July) 1934. Saunders, E. W.: A Bacteriological and Clinical Study of Gastric Ulcer, Ann. Surg. **92**: 222-233 (Aug.) 1930.
5. Glaessner, K.: Pepsin Therapy of Gastric and Duodenal Ulcer, Lancet **1**: 77-79 (Jan. 9) 1932.
6. Meloschi, W.: Contributo alla alla terapia dell'ulcera gastroduodenale con il benzoato di Na, Gazz. d. osp. **54**: 1499-1505 (Nov. 26) 1933.
7. Pitkin, G. P.: A New Treatment of Peptic Ulcer, Am. J. Surg. **19**: 466-478 (June) 1931.
8. Levin, O. L.: The Value of Hemoprotein (Brocks) in the Treatment of Peptic Ulcer, M. Rec. **143**: 39-43 (Jan. 2) 1935.
9. Bolman, H. A.; Schultz, J. L. and Van Kleeck, L. A.: New Intravenous Therapeutic Agent for Control of Peptic Ulcer, New York State J. Med. **34**: 195-199 (March 1) 1934.
10. Levy, M. M., and Levy, E.: Parathyroid Extract in the Treatment of Gastroduodenal Ulcer, Arch. d. mal. de l'app. digestif. **21**: 916-936 (Oct.) 1931.
11. Jones, C. R.: Insulin in Treatment of Peptic Ulcer, Am. J. Digest. Dis. & Nutrition **1**: 135-136 (April) 1934.
12. Weiss, A. G., and Aron, E.: Treatment of Gastroduodenal Ulcer of Man with Injections of Amino Acids (Tryptophan-Histidine), Compt. rend. Soc. de biol. **112**: 1530-1531 (May 2) 1933.
13. Trippe, C. M.: Oral Administration of Metaphen in Treatment of Gastric and Duodenal Ulcer, Ann. Int. Med. **6**: 901-912 (Jan.) 1933.
14. Einsel, I. H.; Adams, W. L., and Meyers, V. C.: Aluminum Hydroxide in Treatment of Peptic Ulcer, Am. J. Digest. Dis. & Nutrition **1**: 513-516 (Sept.) 1934.
15. Fegelson, S. J.: The Treatment of Peptic Ulcer with Gastric Mucin, J. A. M. A. **96**: 673-675 (Feb. 28) 1931.
16. Meyer, J.; Seidman, E. E., and Nechales, Heinrich: Treatment of Peptic Ulcer with Powdered Okra, Illinois M. J. **64**: 339-343 (Oct.) 1933.
17. Reid, M. R., and Lee, H.: Silicon Dioxide in the Treatment of Peptic Ulcer, personal communication to the authors; to be published.
18. Personal communication to the author, April 15, 1935.
19. Exalto, J.: Ulcus Jejuni nach Gastroenterostomie, Mitt. a. d. Grenzgeb. d. Med. u. Chir. **23**: 13, 1911.
20. Mann, F. C., and Williamson, C. S.: The Experimental Production of Peptic Ulcer, Ann. Surg. **77**: 409-423 (April) 1923.
21. Mann, F. C., and Bollman, J. L.: Experimentally Produced Peptic Ulcer, J. A. M. A. **99**: 1576 (Nov. 5) 1932.

V 106
1936

operative procedure was carried out in our laboratory several hundred times in various investigations on peptic ulcer, and ulcer developed in about 95 per cent of the experiments.

These results have been confirmed by Ivy and Fauley,[23] Morton,[23] Ravdin [24] and Weiss.[25]

Weiss and Aron [26] in reporting their results expressed their opinion that the absence of duodenal juice affects especially the digestion of proteins. The proteins arrive in the jejunum as gross polypeptides after the albuminoid molecule has been liberated by the gastric juice but cannot be broken down any further to the assimilable components, the amino acids, because the jejunal secretion is deprived of the pancreatic trypsinogen, which is indispensable to this process. Histidine is thus lacking. They claim that it is one of the four amino acids which cannot be synthesized by the organism (cystine, lysine and tryptophan, they state, are the other three amino acids).

On the basis of these assumptions, Weiss and Aron repeated the experiments with daily subcutaneous injections of histidine-tryptophan mixture. While the two untreated controls died, the four dogs receiving such injections daily, although showing effects of denutrition, remained happy and sprightly. There was no blood in the feces. Autopsy on two of the four treated dogs after five weeks, on one after six weeks and on one after ten weeks revealed that the mucous membrane was normal. No ulcers were found.

Later Weiss and Aron [27] repeated the experiments after daily injections of lysine, tryptophan and histidine. Cystine, the fourth amino acid the organism is unable to synthesize from its own resources, was too difficult to inject. Injections of tryptophan or lysine did not change the evolution of ulcer. Injections of tryptophan and histidine combined or histidine alone did. The dogs became anemic and emaciated but remained in good spirits until they were killed, after a maximal survival permitted for the appearance of ulcerous lesions (five to six weeks?). Blood never appeared in the feces. Autopsies did not reveal ulcers.

CLINICAL REPORTS ON USE OF HISTIDINE PREPARATIONS

Weiss and Aron [27] as a result of the foregoing experiments concluded that under the influence of histidine-tryptophan the gastroduodenal mucosa resists the corrosive effects of the gastric juice. They then started treatment of ulcer patients with histidine-tryptophan, reporting favorable results in twelve patients. The therapy consisted in a daily injection of histidine-tryptophan mixture for three weeks. The doses varied between 1 and 5 cc. for each injection, the solution consisting of 2 per cent histidine and 4 per cent tryptophan. During this time the patients were up and around, some even continuing their occupations and avocations. All previously used regimens, diets or medicaments were discontinued. The results in the twelve patients treated were as follows: The general condition improved and all symptoms disappeared. Pain subsided, usually after the fourth to the sixth injection. The body weight increased at a rate of between 4 and 17 pounds (1.8 to 7.7 Kg.) a week. The gastric hyperacidity diminished and finally became normal, and hemorrhages, if present, stopped. The direct and indirect roentgenologic signs, as niche or spasm, also disappeared.

The therapeutic action of tryptophan and histidine was studied separately by Aron.[28] Injections of histidine alone had a very favorable effect on the clinical evolution of the ulcer, which retrogressed rapidly, while at the same time pains disappeared.

Following the publications mentioned, numerous reports appeared in the foreign literature on the histidine hydrochloride (LaRostidin-Hoffman LaRoche) treatment of peptic ulcer. Blum,[29] Bogendörfer,[30] Spencker [31] and Hessel [32] report that "all" their patients became symptom free after several injections of histidine. These authors reported from six to thirty cases each. They did not restrict their patients' diet nor did they prescribe alkalis.

Deloyers [33] reports that in two of his ten cases the treatment was ineffective. Stolz and Weiss [34] stated that only three of their thirty-nine patients did not respond to treatment. Winter [35] reports unsuccessful results in only one of his twenty-three patients.

Weiss [36] in his latest report states that during the last year and a half ninety-one of his ulcer patients have been successfully treated with histidine. He further points out that during the period of treatment, and in the months following, his patients were on a full diet and received no other medication. The author finally points out that success with histidine should not be expected in ulcer cases with pyloric stenosis. He urges caution in hemorrhagic cases, advising that such medication should not be applied until bleeding has stopped.

The first report in the English language on histidine is from Ernst Bulmer [37] giving a preliminary report on a series of fifty-two unselected peptic ulcer cases (thirty-five gastric, seventeen duodenal). His results were as follows: "(*a*) 58% of symptomatic cures with disappearance of the abnormal x-ray findings; (*b*) 19% of symptomatic cures with persistence of some radiological abnormality; (*c*) 23% of failures. In a follow-up (time not stated), three patients relapsed, and one of the apparent failures improved. The patients having gastric ulcers seemed more amenable than those having duodenal ulcers, and those with a shorter history tended to react more favoraly than those with a longer history."

Volini and McLaughlin,[38] the first American observers, report on twenty-one patients treated with histidine. Their preliminary report is concerned principally with a study of the fasting and the stimulated gastric secre-

22. Ivy, A. C., and Fauley, G. B.: The Chronicity of Ulcers in the Stomach and Upper Intestine, Am. J. Surg. **11**: 531-543 (March) 1930.
23. Morton, C. B.: Observations on Peptic Ulcer (I, II and III), Ann. Surg. **88**: 207-238 (Feb.) 1927.
24. Ravdin, I. S., quoted by Dr. Frank C. Mann.
25. Weiss, A. G.: Ulcères chroniques gastroduodénaux expérimentaux créés par la dérivation des sucs alcalins duodénaux, Strasbourg-méd. **90**: 549-552 (Sept. 15) 1930.
26. Weiss, A. G., and Aron, E.: Orientation nouvelle du problème de l'ulcère expérimental: Le rôle de certains acides aminés dans la pathogénie de l'ulcère et dans sa thérapeutique, Bull. et mém. Soc. nat. de chir. **59**: 898-901 (June 10) 1933.
27. Weiss, A. G., and Aron, E.: Rôle des acides aminés dans l'évolution de l'ulcère expérimental; influence de l'histidine, Presse méd. **41**: 1880-1883 (Nov. 22) 1933.
28. Aron, E.: Recherches sur l'ulcère expérimental et sur le rôle des acides aminés dans son évolution, Strasbourg méd. **93**: 731 (Oct. 25), 769, (Nov. 5) 1933.
29. Blum, P.: Orientation nouvelle de la pathogénie de l'ulcère expérimental gastrique et de la thérapeutique de l'ulcère humain, Bull. gén. de thérap. **184**: 253-260 (June) 1933.
30. Bogendörfer, L.: Treatment of Gastric Ulcer with Histidine Preparation, München. med. Wchnschr. **81**: 1270 (Aug. 17) 1934.
31. Spencker, H.: Histidin in der Behandlung des Magengeschwürs, Deutsche med. Wchnschr. **61**: 713-714 (March 3) 1935.
32. Hessel, G.: Die Behandlung des Magen- und Zwölffingerdarmgeschwürs mit Histidin, München. med. Wchnschr. **81**: 1890-1891 (Dec. 6) 1934.
33. Deloyers, L.: Que penser de l'histidine, thérapeutique nouvelle des ulcères gastro-duodénaux? Nouvelles médicales illus. **2**: 3, 1934.
34. Stolz, A., and Weiss, A. G.: Le traitement de l'ulcus gastro-duodénal par l'histidine; resultats de deux années d'expérience clinique, Presse méd. **43**: 864 (May 29) 1935.
35. Winter, H.: Über eine neue Ulkustherapie mit Histidin-monochlorhydrat (LaRostidin "Roche"), Med. Klin. **31**: 686-688 (May 24) 1935.
36. Weiss, A. G.: Les ulcères expérimentaux, Praxis **9**, No. 21, 1934.
37. Bulmer, Ernst: Histidine Treatment of Peptic Ulcer, with a Note on Fifty-Two Cases, Lancet **2**: 1276-1278 (Dec. 8) 1934.
38. Volini, I., and McLaughlin, R. F.: The Histidine Monohydrochloride Therapy of Gastroduodenal Ulcer: Preliminary Report, M. Rec. **141**: 364, 1935.

tions, reporting a decrease in amount and degree of free and total acids. Both, however, tend to increase toward the latter part of treatment and when it is discontinued. Though they state that the various clinical features and phases will be discussed in a later paper, they nevertheless add that, "in all" their patients, symptomatic relief was obtained very quickly. No other medication than histidine was allowed. All the patients smoked and were encouraged to continue doing so. The diet was an average American diet, tending to contain an excessive amount of roughage. Their patients were allowed coffee, tea, candy and even nuts.

Manginelli [39] treated fifty-two patients with gastroduodenal ulcers, gastritis and gastric neuroses with histidine. The injections were made intramuscularly, although the intravenous route was also found satisfactory. In gastroduodenal ulcers, he states that the rapid analgesic effect of histidine was striking.

Smith [40] reports on twelve patients treated with histidine. All his patients were roentgenologically proved to have ulcer of the lesser curvature. Ordinary diet was permitted without restriction. All his patients became symptom free. A striking feature, he states, was the rapidity with which the general nutrition of the patient improved. In every case there was a substantial gain in weight. In cases in which there had been gastric retention due to pylorospasm, the emptying time improved.

In summary, then, many foreign writers report favorable results with a high percentage of successful immediate responses, from using histidine in the treatment of peptic ulcer. Not a few report that "all" their ulcer patients became symptom free with this method of treatment. I have not been able to find in any publication an analysis of the remote results (long follow up) of histidine treated patients.

AUTHOR'S STUDIES

In order to evaluate clinically any new therapeutic measures for peptic ulcer, certain criteria must be considered:

1. Does the method under consideration produce a higher percentage of remissions in unselected groups of ulcer patients than does the diet-alkali regimen?
2. What percentage of patients not responding to the standard diet-alkali regimen become symptom free when the new method is instituted?
3. Does the new treatment permit patients to tolerate a maintenance diet sooner than the standard treatment?
4. Does the new method prolong the symptom-free interval or prevent recurrence?
5. Does the new method have any effect on gastric acidity?
6. What effect does the new method have on the ulcer deformity as seen by x-rays?
7. Does the new method of treatment produce reactions or untoward effects?

With these criteria in mind, I have observed a series of sixty-seven consecutive ulcer patients. Table 1 shows the location of ulcer and the duration of symptoms. It will be noted that 83.6 per cent of the total number of patients had had ulcer symptoms five years or longer. Of the patients treated with histidine, 90 per cent had had the ulcer syndrome five years or longer. All were roentgenologically proved ulcers. Fifty-six (83.6 per cent) of the patients each had several previous ambulatory standard treatments; thirty-nine (58.2 per cent) had had one or more previous rigid bed-rest Sippy management; fifteen (22.4 per cent) had had appendectomies with the hope that the ulcer would later respond to medical management; thirteen (19.4 per cent) had had previous ulcer hemorrhages; six (9 per cent) had had gastro-enterostomy; three had had perforations; one had had his gastroenterostomy undone, and another had had a gastroenterostomy, later a resection of the stoma for recurrence, and finally a partial gastrectomy (Devine operation). All these, however, returned later with recurrence of ulcer symptoms.

TABLE 1.—*Duration of Ulcer Symptoms and Location of Ulcer in Patients Treated*

	Diet-Alkali Patients	Histidine Patients	Total Patients
Duration of ulcer symptoms			
Less than 5 years	10	4	11
5 to 9 years	10	11	17
10 to 14 years	15	8	16
15 to 19 years	6	10	12
20 to 24 years	7	5	7
25 years and over	3	1	4
Totals	52	49	67
Site of ulcer			
Duodenal	42	39	51
Gastric	7	6	11
Gastrojejunal	4	4	5
Totals	52	49	67

METHOD OF TREATMENT

When these patients presented themselves for treatment, they were asked whether they could report for daily injections of histidine. If they could, twenty-four injections of histidine were given them in twenty-four consecutive days (twenty-three patients were thus treated). If they could not, they were started on the diet-alkali regimen (forty-six patients so treated). Those not responding to the diet-alkali treatment were then given daily injections of histidine (seventeen patients); those not responding to histidine were then started on the diet-alkali regimen (seven patients). There were thus fifty-three patients treated with diet-alkali and forty patients treated with histidine.

The diet used in the diet-alkali regimen was as follows: for patients at rest in bed, hourly feedings of milk and cream plus Sippy powders 1 and 2 with gradual increase by addition of eggs, cereals, and so on (diet 1, original Sippy diet). Ambulatory patients were started on milk, cream, soft boiled or poached eggs, strained cereals, creamed soups, custards, cereal puddings, toast and butter, divided into six feedings a day (diet 2). If, at the end of about ten days, these patients continued to be symptom free, puréed vegetables and fruits were added and the meals were divided into three a day with small feedings between meals (diet 3). Scraped beef, minced chicken and flaked whitefish were added to their diets (diet 4) from six to eight weeks after the beginning of dietetic treatment. Sippy powder 2 was always prescribed, but Sippy powder 1, liquid petrolatum, hot abdominal stupes, gastric lavages and antispasmodics were given only when indicated.

Patients starting on histidine injections were advised to continue with the same diet they had prior to the administration of histidine. Most of the patients treated with histidine were on a diet similar to diet 3 at the time they reported for treatment. After they had become symptom free they were told that they might increase their food as they pleased. No alkalis

39. Manginelli, L.: Histidine in Gastric Therapeutics, Arch. d. mal. l'app. digestif, 25:460 (May) 1935.
40. Smith, D.: The Histidine Treatment of Peptic Ulcer of the Lesser Curvature, with a Note on Twelve Cases, Brit. M. J. 2:154-159 (July 27) 1935.

V 106 1936

were given them. These patients were not necessarily seen by me daily, as the injections were given by a nurse.

The forty patients treated with histidine were given a total of 869 injections: thirty-two patients each received twenty-four consecutive daily injections; four received from twelve to twenty-one, and four received from six to eleven injections.

Eleven of the fifty-three patients treated with the diet-alkali regimen were observed in a hospital; the remaining forty-two were treated ambulantly. Of the forty patients treated with histidine, fourteen were observed in a hospital [41] and twenty-six were treated ambulantly.

RESULTS OF TREATMENT

Results of treatment are discussed in accordance with the criteria that have been mentioned:

1. Table 2 shows the immediate results with histidine treatment. Table 3 shows the immediate results with the diet-alkali regimen. It will be noted that the percentage of remissions and percentage of moderate improvement are practically the same for the two treated groups. For the histidine series, 55 per cent of remissions and 20 per cent of moderate improvement (a total of 75 per cent of favorable responses); for the diet-alkali series, 51 per cent of remissions and 20.7 per cent of moderate improvement (a total of 71.7 per cent of favorable responses).

Claim is made that twenty-four consecutive daily injections of histidine are essential to produce maximum clinical improvement. An analysis of the twenty-two patients who developed remissions on histidine treatment shows that five patients became symptom free at the end of the first injection, six at the end of the second, four at the end of the third, three at the end of the fourth, two at the end of the fifth, one at the end of the eighth, and only one after twenty-one injections. The sudden disappearance of all discomfort in eleven of the patients after one or two injections was very striking and impressive. However, fourteen

TABLE 2.—*Immediate Results with Histidine Treatment*

	Unselected Histidine Patients		Histidine After Diet-Alkali Regimen Did Not Result in Remission		Total Histidine Patients	
	Number	Per Cent	Number	Per Cent	Number	Per Cent
Number of patients	22	....	17	....	40	....
Worse	2	8.7	1	5.9	3	7.5
Unimproved	3	13.0	4	23.5	7	17.5
Moderate improvement	5	21.7	3	17.6	8	20.0
Remission	13	56.5	9	52.9	22	55.0
Moderate improvement + remission	18	78.2	12	70.6	30	75.0

patients each received twenty-four consecutive daily injections and were either only moderately improved or received no benefit from the treatments. Moreover, ten patients who returned within three months after treatment with recurrences of ulcer symptoms (see item 4) were among those who received twenty-four consecutive daily injections. One of the two patients who returned with recurrence of symptoms within four to five months after treatment received only ten injections.

41. Ten patients were observed in Receiving Hospital, Detroit, and four patients in William J. Seymour Hospital, Eloise, Mich. I did not personally observe two of the Receiving Hospital patients and the four treated in the William J. Seymour Hospital. They were, however, observed by the resident physicians of the two institutions. Accurate records are available.

It is therefore apparent that twenty-four consecutive daily injections are not essential either to produce a remission or to prolong the symptom-free period. If five or six (at the most eight) consecutive daily histidine injections do not cause complete disappearance of all ulcer discomforts, the hope of producing a remission or prolonging a symptom-free interval by further histidine treatment is negligible, based on this small series of patients.

TABLE 3.—*Immediate Results with Diet-Alkali Treatment*

	Unselected Diet-Alkali Patients		Diet-Alkali After Histidine Injections Did Not Result in Remission		Total Diet-Alkali Patients	
	Number	Per Cent	Number	Per Cent	Number	Per Cent
Number of patients	46	....	7	....	53	....
Worse	0	0.0	0	0.0	0	0.0
Unimproved	15	32.5	2	28.6	15	32.3
Moderate improvement	9	19.5	2	28.6	11	20.7
Remission	24	52.2	3	42.8	27	51.0
Moderate improvement + remission	33	71.7	5	71.4	38	71.7

The condition of three patients was aggravated during histidine treatments. A brief history follows for each of the three patients:

CASE 1.—W. S., a man, aged 65, had an ulcer history extending over twenty-two years. Gastro-enterostomy and appendectomy were performed in 1915. Bed-rest treatment was given in 1920. Several ambulatory modified Sippy treatments were given from 1930 to 1935. The patient was admitted to the hospital March 25, 1935, when rigid Sippy management was started; moderate improvement occurred but continued distress. Eleven histidine injections were then given, but after the eighth injection the patient began experiencing severe epigastric pain suggestive of penetration. Hourly milk and cream with alkalis were then resumed; histidine was continued. The symptoms did not subside. Operation showed a jejunal ulcer about 1 cm. in diameter, of the perforating type, on the mesenteric side of the jejunum just below the gastro-enterostomy. There were also adhesions. A partial resection of the jejunum to include the ulcer was done. Microscopic study did not show a malignant condition. The patient was symptom free for six weeks following the operation, when he returned with recurrence of symptoms.

CASE 2.—L. R., a man, aged 60, had an ulcer history of six years' duration, during which time he had several ambulatory ulcer managements. He was admitted to the hospital May 10, 1934, with ulcer symptoms. Rigid ulcer management with hourly milk and cream and alkalis was started on admission and continued with only moderate improvement of symptoms. Roentgen examination showed a penetrating deformity in the lesser curvature of the stomach with 50 per cent retention in twenty-four hours. Twenty-four daily consecutive histidine injections were given, with no change in symptoms. A second roentgen examination after histidine showed a perforating ulcer four times the size seen after the first roentgen examination. The patient died shortly afterward. Autopsy showed his liver to be adherent to the stomach along the lesser curvature. A large crater-like ulcer with rounded, indurated edges 8 cm. in diameter was found along the lesser curvature of the stomach, and a small perforation was found in the floor of the ulcer into the lesser peritoneal cavity. Microscopic study did not show malignancy.

CASE 3.—M. M., a woman, aged 62, had an ulcer history of ten years' duration, during which time she had several ambulatory managements resulting in remissions but followed by recurrences. She was admitted into the hospital with an ulcer hemorrhage (hematemesis and melena). Histidine was started the day of admission and continued until twenty-five daily injections were given. During the first two days the patient was given ice chips and morphine but no food by mouth; a direct transfusion of 400 cc. of blood was given her on the second hospital day. On the third day hourly feedings of milk

and cream with alkalis were started. The patient responded nicely to this management, with disappearance of occult blood in the stools. On the ninth day, with the hope that, because of the histidine, she could tolerate a maintenance diet, her diet was changed to three meals a day and increased to the hospital "soft low residue diet." On the next day tarry stools developed (4 plus occult blood). The usual Sippy regimen was instituted, with successful results.

2. Table 2 shows that seventeen patients were treated with histidine after the diet-alkali regimen had resulted in either moderate or no response. It will be noted that nine of the seventeen patients so treated became symptom free and an additional three moderately improved, a total of 70.6 per cent of favorable responses. Though one cannot draw definite conclusions from the results obtained in these seventeen patients, nevertheless it is important to note that by histidine approximately 50 per cent of those cases showing no remission with diet-alkali treatment have been made symptom free and an additional 20 per cent moderately improved. However, the same holds true for the diet-alkali regimen when it is instituted after

TABLE 4.—*Follow-Up Results After Treatment*

	Histidine Series	Diet-Alkali Series
Total followed	20	29
Remission but recurrence in		
Less than one month	6	4
1 to 2 months	5	2
2 to 3 months	2	1
3 to 4 months	0	1
4 to 5 months	1*	1
5 to 6 months	1	0
Total remissions within 6 months	17-85.0%	9-31.0%
Remission, but recurrence in 6 to 12 months	0	2-10.3%
Remission, still symptom free		
6 to 12 months	2	9
1 year or over	0	8
Died since remission was initiated	1*	0
Total followed	20	29

* This patient became symptom free after the first injection of histidine. On the day of the fourteenth injection he developed a mild sore throat. On the day of the twenty-first injection he developed weakness and a mild cough. On the day of the twenty-fourth injection he was hospitalized. There was a questionable pneumonic process in the right lower lobe with an atypical blood picture. One week later a tender mass was noted in the soft tissue over the region of the ninth rib in the anterior axillary line. The hematologic and thermal symptoms diagnosis was acute myelogenous leukemia, which was confirmed two months later at postmortem examination. During the two months of his life following the histidine injections he was symptom free so far as the ulcer was concerned. There is no evidence that any connection exists between injections of histidine and the development of myelogenous leukemia.

histidine results in no remission: three of the six patients so treated became symptom free and two moderately improved. This is important.

3. It is claimed by many authors that patients treated with histidine are able to tolerate a maintenance diet even during the early stage of treatment. That this is not borne out by my series of patients is evident from the fact that eight of the forty histidine-treated patients were only moderately improved, seven were not improved and in three the condition was aggravated by treatment—a total of eighteen (45 per cent) in whom the diet could and should not be increased. Only twenty-two (55 per cent) of the patients became symptom free. Twenty of the twenty-two rapidly increased their diet so that at the end of four weeks they were on a full diet with three meals a day. The immediate response to histidine in these twenty patients was excellent.

4. A follow up of twenty patients who developed remission in symptoms after histidine treatment (table 4) showed that recurrences of symptoms appeared in 85 per cent of the patients within six months after histidine injections: six within one month, five within one to two months, two within two to three months, two within four to five months, and two within five to six months after treatment. Similar follow up of twenty-nine patients on diet-alkali management showed only 31 per cent with recurrence of symptoms within the same period of time: four within one month, two within one to two months, one within three to four months and one within four to five months after onset of dietetic treatment. This speaks unfavorably for the lasting benefit to be obtained from the use of histidine in ulcer therapy, as compared with the diet-alkali regimen.

It is possible that with the histidine treatment the short duration of remissions and the high percentage of recurrence resulted because of rapid increase in diet. As stated before, twenty of the twenty-two patients who showed remission with histidine were on practically full diets four weeks after beginning treatment. The patients on diet-alkali management were schooled in the essential dietetics of their treatment; those treated with histidine were not so educated, had a more liberal diet and suffered early recurrences.

Patients not responding to histidine were changed to the diet-alkali regimen and vice versa (tables 2 and 3 show the immediate results). Four patients were not improved after both diet-alkali and histidine treatment. They were then again placed on diet-alkali management. One became symptom free. Two were moderately improved. One of the patients in the diet-alkali series did not show improvement until gastric lavage was instituted. Another improved when milk was withdrawn from his diet when skin tests proved him allergic to milk. By changing from one method of treatment to another and trying all means at hand to "tire the ulcer out," I was able to produce remissions in forty-nine (73.5 per cent) patients and moderate improvement in nine (13.4 per cent) patients, a total of fifty-eight, or 86.5 per cent, favorable responses. The nine patients not responding to medical management (diet-alkali regimen, histidine or both) had the following complications: two, mild hyperthyrodism; two, myocarditis, one, arteriosclerosis; one, perforation (death); one, high grade retention; one, penetrating jejunal ulcer, and one, chronic appendicitis and chronic cholecystitis. The latter three were subsequently operated on.

5. Effect of Histidine Treatment on Gastric Acidity: In seventeen of the forty patients, gastric acidity determinations were made before and after the twenty-four histidine treatments: five patients showed no change in the acid curve; six showed a slight increase and six a slight decrease in degree of free and total acids. Of the six patients who showed an increase in the degree of acidity, five were symptom free and one was moderately improved; of the six patients with a decrease in acids, five were symptom free and one was moderately improved; and of the five showing no change in the acid, two were symptom free and three moderately improved.

It is therefore evident that clinical improvement does not depend on the slight alteration in acidity during treatment.

6. Effect on Ulcer as Shown by Roentgen Examination or Operation: I have obtained either roentgen or operative check of the healing or nonhealing of the ulcer in twenty-four of the forty histidine-treated patients. Four patients with gastric ulcer and two with gastrojejunal ulcer showed the same lesions to be pres-

V 106
1936

ent after histidine treatment. One patient showed a lesser curvature ulcer four times the size of the original ulcer; he subsequently died and an autopsy showed a perforated ulcer with peritonitis. Still another patient with gastric ulcer was operated on after histidine treatment and an ulcer was found at the pylorus. Of the sixteen patients with duodenal ulcer, the roentgenologist reported "improvement" or "evidence of healing" in eight; clinically, four of these patients were symptom free, three were moderately improved, and one was unimproved at the time of the second roentgen examination. In the remaining eight the roentgenologist reported no change in the defect: all eight were symptom free. Two patients with duodenal ulcers were subsequently operated on and ulcers were found at operation.

Of the twenty-four patients checked by either roentgen examination or operation after histidine treatment, none of the patients showed disappearance of their ulcers. Of course, persistence of deformity in the duodenum as shown by roentgen examination is not indicative of activity or nonhealing of the ulcer.

Bulmer [37] reports "58 per cent of symptomatic cures with disappearance of the abnormal x-ray findings." However, it should be noted that thirty-five of the patients in his series of fifty-two had gastric ulcers. Of the thirty who became symptom free with normal roentgenograms, twenty-two (73.3 per cent) were in the gastric ulcer group. It is well known that gastric ulcers frequently disappear on diet-alkali management.

7. Reactions: Sixteen (40 per cent) of the forty histidine-treated patients developed mild reactions. These occurred only in the patients treated ambulantly. No reactions were observed in the hospital patients. After the second, third, fourth, or fifth injections these patients complained of weakness (particularly in the knees), a tired feeling, aches and pains in the muscles of the arms and legs, and a feeling of being "all in" and "run down," as if they had the "grip." The patients had no chills, fever, vomiting or abdominal pain. They were not examined for leukocytosis. Two of the patients were so "run down" that each had to rest in bed for twenty-four hours. After injections one patient experienced severe temporal headaches with pain in the eyeballs associated with lacrimation. His symptoms were of three days' duration and so severe that he could not sleep at night.

Of the sixteen who experienced these reactions, eleven became symptom free, four were moderately improved and one was unimproved.

Five of the ambulatory and six of the patients in the hospital group became symptom free without having the reactions.

Obtaining a reaction therefore does not mean that the patient will become symptom free; nor is it necessary for success in treatment.

ULCER PATIENTS TREATED WITH INJECTIONS OF DISTILLED WATER

To determine whether the remissions obtained by histidine injections were a direct result of adding this amino acid—which the ulcer patient lacks—as Weiss and Aron premise, I am at present treating ulcer patients with daily injections of 5 cc. of distilled water as controls similar to the foregoing series. Of twenty patients so far treated, the results so far compare favorably with those obtained after histidine injection. Twelve, or 60 per cent, became symptom free (compared with 55 per cent of the forty histidine patients); five became symptom free after the first injection of distilled water, three after the second, two after the third, one after the fourth, and one after the fifth injection of distilled water. However, the number of patients is too small and the follow up too short for definite conclusions. The results with injections of distilled water will be given in a subsequent communication.

INDICATIONS FOR THE USE OF HISTIDINE TREATMENT

In my experience, I do not know of any one method of treatment that produces remission in "all" ulcer patients, notwithstanding several reports in the literature. In evaluating the high percentage of favorable results with histidine or the other "newer" methods, one must take into consideration the natural life cycle of peptic ulcer. Many ulcer patients develop spontaneous remissions. Not infrequently patients become symptom free immediately after intake of the barium sulfate mixture for x-ray study. Two patients scheduled for histidine treatment became symptom free immediately after barium intake and before histidine was given. Moreover, good results are obtained in many patients under the standard diet-alkali-antispasmodic regimen. Unless these facts are taken into consideration, one is prone to become "overenthused" by newer procedures.

Results obtained in forty patients (table 2) do not warrant routine injections of histidine in all ulcer patients. The expense involved, the daily visits to office or clinic, the twenty-four consecutive intramuscular injections, the mild reactions experienced by an appreciable number (40 per cent) of patients, the high percentage of recurrences (85 per cent) within six months after treatment, and, what is more important, the fact that approximately the same percentage of patients respond favorably to the diet-alkali regimen without histidine injection — these speak against the routine use of histidine in ulcer therapy.

Histidine therefore should not replace the usual diet-alkali management of ulcer. However, it may be very valuable as "extra artillery," when such is deemed necessary. Ulcer patients should first be placed on an ulcer diet with frequent feedings and alkalis. In addition, local heat, antispasmodics, sedatives and aspiration should be prescribed when indicated. Mental rest should be repeatedly stressed. Attention should also be given to coexisting disorders, as focal infection, constipation, hyperthyroidism and emotional conflicts. If patients prove refractory on these regimens, histidine injections may be valuable. About 50 per cent of our patients not responding to the diet-alkali management become symptom free and an additional 20 per cent moderately improved. As an adjuvant to our therapeutic armamentarium, therefore, it is of value.

MECHANISM AND RATIONALE OF THE HISTIDINE TREATMENT

Weiss and Aron [38] assumed that their dogs which had been operated on developed peptic ulcers because of a deficiency or absence of the amino acid histidine. They state that the operation deprived the jejunal secretion of pancreatic trypsinogen, thereby preventing the breaking down of the gross polypeptides into their assimilable components the amino acids. They were unable to produce ulcers when histidine was furnished by injection. These facts caused them to formulate the histidine deficiency theory for ulcer production in man and form the basis for the present histidine ulcer therapy.

This experimental evidence, however, does not conclusively prove that peptic ulcer, either in experimental dogs or in man, is a result of histidine deficiency. As a matter of fact, numerous experiments by various workers definitely point in a different direction.

Mann and Williamson [39] transplanted the common bile duct and the pancreatic duct into the terminal ileum, leaving the duodenum in its normal position. Neither trypsinogen nor trypsin could reach the jejunum. Amino acids or histidine could not be formed. Only 50 per cent of the animals developed ulcers; 50 per cent did not.

Hoerner [42] reports that evulsion of the pancreatic ducts, preventing the pancreatic secretion from reaching the intestinal tract, is rarely followed by ulcer. The pancreatic proteolytic pro-enzyme in these animals could not reach the intestine. Proteins thus could not be broken down into the amino acids. According to Weiss and Aron, there should be a deficiency or lack of histidine. Yet ulcers rarely developed.

Mann and Williamson [39] eliminated the entire normal mechanism for receiving the acid-gastric contents by deviating the duodenum together with all the secretions poured into it. In this series of experiments, as well as in Weiss and Aron's experiments (on which they base their histidine deficiency theory of ulcer) the jejunum was thus deprived not only of trypsinogen but also of the pancreatic amylolytic enzyme (amylase), the pancreatic lipolytic enzyme (lipase) of bile (bile salts, acids and pigments) and of the duodenum with the protective mechanism of the duodenal mucosa and secretion. By depriving the jejunum of all these there is a disturbance not only in protein metabolism but in the carbohydrate and fat metabolism as well. There is in addition a disturbance in the acid-alkali relationship in the jejunum compared with the normal jejunum, and a change in the mechanical factors as described by Mann and Williamson [39] and by Morton.[43] In short, there is a total disturbance of all the biochemical processes of digestion. In this group 95 per cent of the animals developed chronic callous ulcers.

Morton [43] repeated the experiments of Mann and Williamson. In addition, he reports that, on performing a gastro-enterostomy after the ulcers formed, "in every case the original jejunal ulcer showed unmistakable evidence of healing" while the duodenum and both bile and pancreatic ducts still drained into the ileum. These ulcers healed in spite of the fact that there was a so-called histidine deficiency. However, coincident with the healing of the original ulcers, new ulcers formed in the efferent loops of the gastro-enteric anastomosis. "The acid alkali imbalance following surgical duodenal drainage," he states, "and the force with which the contents emptying from the stomach impinged directly on a relatively circumscribed area of the intestinal wall, are suggested as having an important bearing on the formation of ulcers."

Mann and Williamson,[39] Morton,[43] Mann and Bollman,[44] McCann,[45] Ivy and Fauley,[32] Matthews and Dragstedt [46] and more recently Harper [47] have referred to three factors as significant in the development of peptic ulcer in surgical duodenal drainage: the chemical factor, the mechanical factor and the susceptibility of the mucosa. All these factors seemed to be of significance in the production of the experimental ulcers described.

Ivy [48] writes that "Weiss and Aron did not 'run' their Exalto-Mann-Williamson dogs long enough. The Exalto-Mann-Williamson operation, because of the digestive disturbance it creates, has a mortality per se; i. e., such a dog may die at from three to ten weeks without ulcer. In the therapeutic studies we have been conducting during the past four years on Exalto-Mann-Williamson dogs, we have observed this frequently. In order to interpret the results of our therapy, we operated on forty-two dogs for control. Of the forty-two untreated control dogs all died from jejunal ulcer in from fourteen to 120 days postoperatively, the average being seventy-eight days. When the presence of ulcer was diagnosed by blood in stools or gastric analysis, it was found that only 50 per cent of the dogs developed ulcer prior to seven weeks (forty-nine days); all had not developed ulcer until fourteen weeks postoperatively. So I cannot place much weight on the results reported by Weiss and Aron." Weiss and Aron [39] examined two of their four dogs post mortem five weeks after histidine-tryptophan treatment, one after six weeks and one after ten weeks.

It is difficult, therefore, to see why the disturbance in the protein metabolism and the deficiency in histidine (if there is such a deficiency) is blamed solely for the resultant ulcer. Enzymes, bile, and the disturbance in carbohydrate and fat metabolism, as well as the chemical and mechanical factors and susceptibility of the mucosa, are hardly considered by Weiss and Aron in the process of ulcer formation. The very basis of Weiss and Aron's histidine-deficiency theory is questioned by Ivy [48] when he states that "Weiss and Aron did not 'run' their Exalto-Mann-Williamson dogs long enough" after histidine-tryptophan injections.

It appears that there is no sufficient scientific evidence that a deficiency of histidine is the cause of peptic ulcer. The experiments performed by Mann and Williamson,[39] Hoerner,[42] Morton,[43] Mann and Bollman,[44] McCann,[45] Ivy and Fauley,[32] Matthews and Dragstedt [46] and Harper [47] do not point in this direction. Confirmatory work by other investigators of Weiss and Aron's experiments have not been reported. Clinical end results after histidine injections in my series of ulcer patients do not give a sufficiently high percentage of remissions to point in favor of the histidine deficiency theory.

In my opinion, histidine represents one of a number of substances [49] that may be useful as "extra artillery" if patients prove refractory to the standard diet-alkali ulcer regimen. Remissions, when they result after these injections, may be explained by one or more of the following:

1. The intermittent nature of the disease: Ulcers are characterized by symptom-free intervals and relapses. Persistence of treatment, therefore, is important. A symptom-free interval may follow.

2. The psychic effects: added confidence in "something new," instead of "the same old diet and powders" so well known to ulcer patients; also greater encouragement due to more frequent visits to physicians, as well as more careful and longer observation.

42. Hoerner, M. T.: The Effect of Exclusion of the Pancreatic Secretion by Evulsion of the Pancreatic Ducts on the Reaction of the Duodenal Content, Am. J. Digest. Dis. & Nutrition 2: 295-297 (July) 1935.
43. Morton, C. B.: Observations on Peptic Ulcer: V. Ann. Surg. 87: 401-422 (March) 1928.
44. Mann, F. C., and Bollman, J. L.: A Symposium Concerned with the Duodenal Factors in the Neutralization of Acid Chyme, Am. J. Digest. Dis. & Nutrition 2: 284-285 (July) 1935.
45. McCann, J. C.: Experimental Peptic Ulcer, Arch. Surg. 19: 600 (Oct.) 1929.
46. Matthews, W. B., and Dragstedt, L. R.: The Etiology of Gastric and Duodenal Ulcer, Surg., Gynec. & Obst. 55: 265 (Sept.) 1932.
47. Harper, F. R.: Development and Treatment of Peptic Ulcer, Arch. Surg. 30: 394-404 (March) 1935.
48. Ivy, A. C.: Personal communication to the author, Sept. 17, 1935.
49. Footnotes 1-12.

V 106
1936

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3. A nonspecific protein reaction: It is thought that local cellular injury leads to the absorption of protein, affecting the chronically inflamed locus (the ulcer) by stimulating leukocytosis, mobilization of immune bodies, dilatation of capillary vessels, and so on.

4. A nonspecific action on the sympathetic nervous system which in some way influences the nervous control of the ulcer area, inducing hypomobility and hypoperistalsis.

SUMMARY

1. Of sixty-seven patients with peptic ulcer, fifty-three were treated with a diet-alkali regimen and forty patients with histidine.

(*a*) Of the patients treated with diet-alkali, 51 per cent became symptom free and 20.7 per cent were moderately improved (a total of 71.7 per cent of favorable responses). Of the patients treated with histidine, 55 per cent became symptom free and 20 per cent were moderately improved (a total of 75 per cent of favorable responses).

(*b*) Of seventeen patients treated with histidine after the diet-alkali management failed to produce remissions, 52.9 per cent became symptom free and 17.6 per cent moderately improved (a total of 70.6 per cent of favorable responses).

(*c*) Of nine patients treated with the diet-alkali after histidine failed to produce remissions, 42.8 per cent became symptom free and 28.6 per cent moderately improved (a total of 71.4 per cent favorable responses).

(*d*) By changing from one treatment to another and trying all means at hand, to "tire out the ulcer," 73.5 per cent became symptom free and 13.4 per cent moderately improved (a total of 86.5 per cent of favorable responses). Of the nine patients not responding to medical management, four had ulcer complications necessitating surgery and five had medical complications such as myocarditis, hyperthyroidism or arteriosclerosis.

2. A follow up of patients who developed remissions showed that 85 per cent of the patients treated with histidine developed recurrences of ulcer symptoms within six months after treatment. Of the patients who developed remissions after the diet-alkali regimen, only 31 per cent returned with ulcer symptoms within six months (table 4).

3. Twenty-four consecutive daily injections of histidine are not essential to produce a remission or prolong a symptom free period. If five or six (at the most, eight) consecutive daily histidine injections do not cause complete disappearance of all ulcer discomforts, the hope of producing a remission or of prolonging a symptom-free interval by further histidine injections is negligible, based on this small series of patients.

4. About one third of seventeen patients showed a slight increase in the acid curve; one third showed a slight decrease and the remaining third showed no change in degree of acidity after histidine injections. Clinical improvement or failure to improve did not depend on the resultant gastric acidity curve.

5. Of the twenty-four patients checked by either roentgen examination or operation after histidine treatment, not one showed disappearance of the ulcer deformity.

6. Sixteen (40 per cent) of the forty histidine-treated patients developed mild reactions. Obtaining a reaction does not mean that the patient will become symptom free; nor is it necessary for success in treatment.

CONCLUSIONS

Results obtained in forty patients do not warrant routine injections of histidine in all ulcer patients. The expense involved, the daily visits to office or clinic, the twenty-four consecutive intramuscular injections, the mild reactions experienced by an appreciable number of patients, the high percentage of recurrences within six months after treatment, and, what is more important, the fact that approximately the same percentage of patients respond favorably to the diet-alkali regimen without histidine injections—these speak against the routine use of histidine in ulcer therapy.

Histidine produced remission of ulcer symptoms in 55 per cent of the patients treated. When its administration produced remission of symptoms, it did not prolong the symptom-free interval nor did it prevent recurrences; 85 per cent of the patients who developed remissions have returned with ulcer symptoms within six months after treatment.

However, histidine may be used as "extra artillery" in patients not responding to the diet-alkali-antispasmodic management. About 50 per cent of the latter patients may thereby become symptom free and an additional 20 per cent moderately improved.

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HEMOGLOBIN AND RED CELL CONTENT OF THE BLOOD OF NORMAL WOMEN

DURING SUCCESSIVE MENSTRUAL CYCLES

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This is a report of one phase of an iron metabolism study of four normal college women carried out over several successive menstrual cycles. Since the larger proportion of iron exists in the body in the red blood cells, this study of necessity included determinations of hemoglobin and red cell values of the blood of the subjects. In view of the conflicting nature of the data available in the literature, daily determinations of hemoglobin and red cell content were made during the greater part of the study in the hope of making some contribution to this field of investigation. The results of these daily determinations are herewith presented and considered in relation to the different phases of the menstrual cycle.

LITERATURE

The literature on this subject is not extensive and the observations reported are confusing and contradictory. The one point of agreement appears to be that variations in both hemoglobin and red cell values exist. The relation of these variations to the different phases of the menstrual cycle, however, is not consistently demonstrated. In general, the variations in the erythrocytes are more evident than in the hemoglobin, but usually the two follow the same course. Some workers [1] have found a premenstrual rise in the erythrocytes

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The authors received the technical assistance of Mr. Gerald Brown, who took the blood samples and made the cell counts.

Since space does not permit the inclusion in this article of all daily figures, copies of these will be lent to any one requesting them.

1. Blumenthal: Beitr. z. Geburtsh. u. Gynäk. **11**: 614, 1908. Detre, L.: Ztschr. f. d. ges. exper. Med. **50**: 340, 1926. Holler, G.; Melicher, H., and Reiter, N.: Ztschr. f. klin. Med. **100**: 364, 1924. Krutschenhoff: Dissertation, Paris, 1909; quoted by Gumprich.[2] Pold, A.: Wien. klin. Wchnschr. **71**: 238, 1910. Reinert: Blutmenstruation und Zählung, 1891. Sfameni: Zentralbl. f. Gynäk., 1899; quoted by Gumprich.[2]

followed by decrease with the onset of the flow; others [2] have reported a premenstrual decrease and still others no change coincident with menstruation.

Two larger and more complete studies are in the last group. Gumprich [3] found that variations occurring in both the hemoglobin and the red cell content during menstruation were not definite and concluded that it is impossible to consider that there is a definite, regular influence of the menstruation process on the blood picture. The most valuable and recent data are presented by Reich and Green.[4] In an effort to obtain a better idea of the erythrocyte changes in the blood and bone marrow coincident with the various phases of the menstrual cycle they determined the hemoglobin, the red cells and the percentage of reticulocytes in the blood of six normal women twice a week for three months. They conclude that there are no definite variations in the hemoglobin and the red cells associated with menstruation. They offer as evidence of the validity of their conclusion the fact that there was no definite postmenstrual reticulocyte peak. This indicates that the bone marrow is not called on to increase its regenerative activity following menstruation.

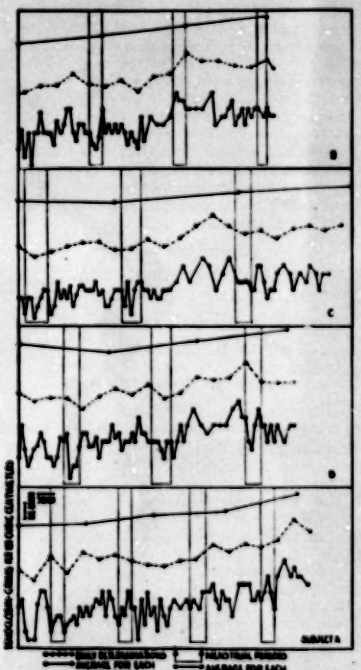

Chart 1.—Variation in hemoglobin values of normal women.

The lack of agreement among workers is perhaps due largely to the fact that at no time have daily determinations been made during complete and successive menstrual cycles to establish what variations are normal and therefore what variations may be expected in any phase of the cycle. The data collected in the present study on the hemoglobin and red cell content of the blood of normal women during a long-time iron metabolism study furnish a more complete record of the variations of these blood constituents than has heretofore been reported.

EXPERIMENTAL

Four normal college women, three of them 21 years old and one 27 years old, served as subjects. The technic of the balance study involved the weighing and analysis of all the food eaten by the subjects and the collection and analysis of all the excreta, including the menstruum, over a continuous period of three months for two subjects and of four months for the other two subjects. The diet was planned to meet all the requirements of nutrition standards for adequacy and was constant in kind and amount throughout the experimental period. Analyses now in progress indicate that the average daily intake of iron by each subject ranged from 10 to 15 mg. During her fourth and fifth menstrual cycles one subject was given daily a supplement of 5 mg. of iron in the form of ferric ammonium citrate. This was discontinued during the sixth and last cycle of the study.

Cutaneous blood samples were taken immediately before lunch each day. This time was chosen because the activity of the subjects varied less from morning to morning than at any other time. Two erythrocyte counts were made on each blood sample and accepted only if they checked within 20. This means a difference in the final values of 0.2 million cells per cubic millimeter of blood. The same technician drew the samples and counted the cells during the entire study. Each day another technician prepared and counted a second slide from one of the blood pipets. In this way the count on one blood sample was rechecked each day and each of the four blood counts was rechecked every fourth day. Hemoglobin was determined by the method of Newcomer.[5] The hemoglobinometer was calibrated by the oxygen capacity method of Van Slyke.[6]

RESULTS

The results of daily determinations of hemoglobin and red cell content of the blood of each subject, the averages for each five-day period, and the averages for each menstrual cycle are shown graphically in the accompanying charts.

Observation of these data shows the occurrence of day to day variations in both hemoglobin and red cell values. These variations lie mostly within the limits of experimental error, but there are occasional sharp rises and drops. A tabulation of these variations shows that of all the day to day variations calculated for hemoglobin 57 per cent is no greater than 0.5 Gm. and 80 per cent is no greater than 1 Gm. For red cell counts, 90 per cent of the variations do not exceed 0.3 million. Moreover, the variability for the entire period is small. This is indicated by low standard deviations and coefficients of variation for both hemoglobin and red blood cells. It is significant, however, that even under carefully controlled conditions of diet and activity and with the most meticulous care in technic the average standard deviation for hemoglobin is

2. Merletti: Ann. di ostet. e ginec., 1900, p. 673. Reinl: Volkmanns Sammlung klin Vorträge, 1884; quoted by Gumprich.[3]
3. Gumprich, G.: Beitr. z. Geburtsh. u. Gynäk. 19:433, 1914.
4. Reich, Carl, and Green, Dorothy: Red Cell Regeneration During the Menstrual Cycle, Arch. Int. Med. 49:534 (March) 1932.
5. Newcomer, H. S.: J. Biol. Chem. 27:449 (March) 1919.
6. Van Slyke, D. D., and Neill, J. M.: J. Biol. Chem. 61:523 (Sept.) 1924.

V 106
1936

0.9 Gm. Though not excessive, this deviation is large enough to place decided limitations on the significance of any single determination of hemoglobin as often made in clinical examinations by methods far less accurate than the colorimetric one used in this study. The standard deviation of the red cell values is 0.31 million, which is scarcely above the experimental error of the technic and less than the error accepted in general clinical determinations.

Since it was thought that the amount of rest might influence daily hemoglobin and red cell values, sleep records were kept for each subject. When either the absolute values or the daily variations in the hemoglobin and red cell concentrations were compared with the number of hours of sleep there was no correlation. Reasoning that perhaps there was a physiologic lag before the effects of loss of sleep were evidenced, the hemoglobin and red cell values were compared with sleep records of two nights preceding the time of each

Comparison of the Average Daily Hemoglobin and Red Cell Content of the Blood of Normal Women During Menstrual Cycles and Menstrual Periods

Subject	Cycle	Length in Days	Average Daily Hemoglobin, Gm./100 Cc.	Average Daily Red Blood Cells, Million per Cu. Mm.	Period	Length in Days	Average Daily Hemoglobin, Gm./100 Cc.	Average Daily Red Blood Cells, Million per Cu. Mm.
A	1	28	12.95	4.73	1	5	12.54	4.70
	2	31	13.46	4.75	2	5	13.69	4.73
	3	29	13.76	4.80	3	6	13.67	4.57
	4*	31	14.80	4.80	4	5	14.89	4.76
	5*	34	14.72	5.36	5	6	.....	.....
	6†	32	14.00	4.53	6	5	.....	.....
B	1	29	12.54	4.67	1	7	12.54	4.68
	2	27	13.23	4.65	2	7	12.80	4.60
	3	28	13.91	4.64	3	6	13.80	4.60
C	1	30	11.42	4.30	1	8	11.27	4.78
	2	28	12.57	4.32	2	7	11.85	4.38
	3	29	12.63	4.45	3	6	12.40	4.44
	4†	31	13.00	4.41	4	6	.....	.....
D	1	27	13.08	4.60	1	5	12.80	4.61
	2	28	13.70	4.66	2	5	13.60	4.72
	3	25	14.30	4.70	3	4	14.30	4.71

* Five milligrams of iron given daily in form of ferric ammonium citrate.
† Three daily determinations.

blood determination, and still no measurable relation existed. It was therefore concluded that these daily values were not influenced by an occasional loss of sleep.

In addition to the daily variations in these blood components chart 1 demonstrates a definite upward trend of hemoglobin values for each of the four subjects over the period of the study. The increases amount in every case to 1 Gm. or more of hemoglobin per hundred cubic centimeters of blood. Such a trend is not observed in the red cell values; these remain remarkably constant throughout the experimental period for each subject. Of special interest in this regard is subject A. During her fourth and fifth menstrual cycles she was given a daily supplement of 5 mg. of iron in the form of ferric ammonium citrate. The total amount of iron thus added to the diet was 225 mg. The average hemoglobin concentration, expressed in grams per hundred cubic centimeters of blood, rose from 13.8 for cycle 3 to 14.8 for cycle 4 and 14.7 for cycle 5. The average red cell values were 4.80, 4.80 and 5.36 million per cubic millimeter for cycles 3, 4 and 5. During cycle 6 the iron therapy was discontinued. Blood determinations for the last three days of this cycle showed that the hemoglobin and red cell content had fallen to 14 Gm. and 4.53 million, respectively.

The influence of the menstruation process on the blood picture is the next point for consideration. In the accompanying table the average daily hemoglobin and red cell values for each menstrual cycle for each subject are compared with the average daily values for the menstrual period in each cycle. In the entire series the differences between the averages for the menstrual cycle and the menstrual period within the cycle do not exceed the experimental error of the method. The hemoglobin for subject D for cycle 2 is the only exception to this; it averages 13.7 Gm. for the cycle and rises to 15 during the five days of menstruation. From

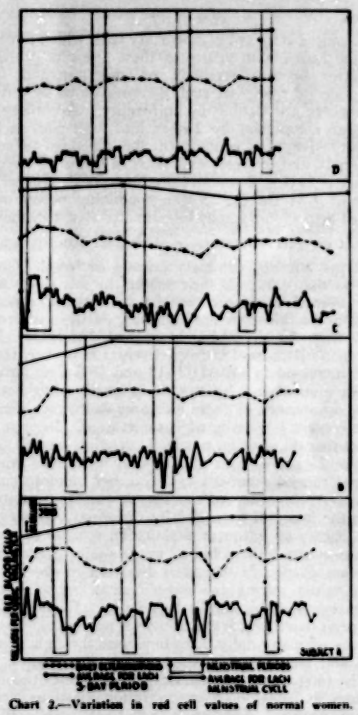

Chart 2.—Variation in red cell values of normal women.

these data it appears that there is no definite consistent effect of the process of menstruation on the daily values during the entire menstrual cycle for any of the subjects. That the averages for the hemoglobin and red cell content presented in the table do not mask any regular rise and subsequent drop in either component is evidenced by the daily values plotted in charts 1 and 2.

Since it has been shown that there are daily variations in both hemoglobin and red blood cells which sometimes exceed the experimental error, one may well wonder whether these greater variations occur in some definite relation to the menstrual period. In an effort to answer this question and yet lacking sufficient data for a correlation technic, the magnitude of the day to day variations in the hemoglobin and red blood cell values was calculated for four stages of the cycle: the

premenstrual period, which includes the seven days preceding the flow; the menstrual period, which varies in length according to the individual; the postmenstrual period, which includes the seven days following the cessation of the flow, and the intramenstrual period, which includes the days between the end of the postmenstrual period and the premenstrual period of the succeeding cycle. The results indicate that not only do the greater number of daily variations lie within the limits of experimental error but that when marked variations occur they do so irrespective of the different phases of the menstrual cycle.

COMMENT

Choosing a standard of normality with which to compare the hemoglobin values of these subjects presents difficulties because methods of determination and expression of results of such determinations by different workers are lacking in uniformity. According to the figures compiled by Peters and Van Slyke,[7] the normal hemoglobin content of the blood of women between 16 and 60 years expressed in terms of oxygen capacity is 19.0 ± 2 volumes per cent. With Hufner's[8] factor of 1.34 for the oxygen combining power of a gram of hemoglobin it may be estimated that 19 volumes per cent oxygen represents $\frac{19.0}{1.34}$ = 14.1 Gm. of hemoglobin per hundred cubic centimeters of blood. Compared to this standard, each subject in this study was below normal in respect to the hemoglobin concentration of her blood at the beginning of the study; the values were 12.95, 12.54, 11.62 and 13.06 Gm. for subjects A, B, C and D respectively. However, these values increased to 14, 13.92, 13 and 14.3 Gm. during the period on what is believed to be an adequate diet.

The significance of these increases in average hemoglobin content is worthy of consideration. In view of the fact that the average standard deviation was 0.9 Gm. and that 23 per cent of all the daily variations which occurred ranged from 0.6 to 1 Gm. per hundred cubic centimeters, the observed rise may appear to be merely within the range of normal daily variations. However, this is hardly an adequate explanation for the constant increase of the hemoglobin of every subject. Also any consistent change in the same direction in the hemoglobin values during the experimental period would tend to increase the standard deviation. Furthermore, the figures from which the increases are calculated are averages of many daily determinations throughout the cycles and not values of single determinations.

It is interesting to calculate what these possible increases in hemoglobin concentration mean in terms of iron storage. Subject A weighs 59 Kg. With Chang and Harrop's[9] average figure for total blood volume of 70 cc. per kilogram, subject A would have 4,130 cc. of blood. An increase of 1 Gm. of hemoglobin per hundred cubic centimeters of blood would total 41.3 Gm. of hemoglobin. Since hemoglobin is 0.34 per cent iron, this increase would represent the storage of 140 mg. of iron above that used for daily metabolic needs and for losses in the menstruum. Similarly an increase of 1 Gm. of hemoglobin per hundred cubic centimeters of blood would represent a storage of 142, 107 and 128 mg. of iron in subjects B, C and D respectively. When this storage is expressed per kilogram of body weight the value is 2.3 mg. for every subject. If the increases in hemoglobin in all the subjects are significant, the storage of these amounts of iron is of practical importance. It would indicate that, although the diet contained only the standard recommendation of from 10 to 15 mg. of iron daily, this amount was sufficient to allow for storage when other dietary essentials were liberally supplied.

The addition of 5 mg. of iron daily in the form of ferric ammonium citrate to the diet of subject A during cycles 4 and 5 meant an increase of 115 mg. of iron above that furnished by the daily diet during each cycle. From the table it may be seen that the hemoglobin concentration rose 1 Gm. during the first cycle of the iron therapy and remained at this higher level during the second cycle. Three determinations made at the end of the study indicate that it had dropped 0.7 Gm. during the last cycle when the iron supplement was discontinued. It is not possible to generalize from such meager data, but certainly this is a field worthy of further investigation. Considering that a person's daily diet contains only about 10 to 15 mg. of iron, it is not surprising that a long time is required to increase hemoglobin concentration significantly when no additional, readily available iron is supplied for blood building purposes. Verification of this theorizing may be possible when the iron analysis of all the foods, feces and menstruums for each subject are complete. The question may well be raised as to whether the subjects had yet, at the end of the study, attained an optimum iron content of their tissues or whether succeeding months under the experimental regimen would have resulted in further storage of this mineral.

The fact that the average standard deviation of all the hemoglobin determinations is 0.9 Gm. per hundred cubic centimeters of blood when the subjects were under reasonably controlled conditions suggests the reservations necessary in interpreting the significance of single determinations.

If the standard for the normal red blood cell values for women is calculated from the figures summarized by Peters and Van Slyke,[7] normal adult blood with an oxygen capacity of 19 volumes per cent contains 4.8 million cells per cubic millimeter. This is higher than the standard of from 4 to 4.5 million usually given in physiology textbooks. In either case the number of red cells in the blood of these subjects is within the normal range; the mean values were 4.8, 4.6, 4.4 and 4.6 for subjects A, B, C and D respectively. In the case of subject A during the iron therapy the number of red cells increased 0.5 million during the last half of the iron therapy period. Although the significance of this may be questioned, it is of interest to note that the number decreased almost a million when the ferric ammonium citrate was discontinued.

SUMMARY AND CONCLUSIONS

The hemoglobin and red cell content of the blood of four normal women on a constant diet was determined almost daily for three months. Analysis of the data shows the occurrence of daily variations in both hemoglobin and red cells, the majority of which are not greater than the experimental error. The standard deviation for the entire series is 0.9 Gm. for hemoglobin and 0.31 million for red cells.

There was a definite upward trend in the hemoglobin values of every subject during the entire period. The values increased from 12.95, 12.54, 11.62 and 13.06 Gm. per hundred cubic centimeters for subjects

7. Peters, J. P., and Van Slyke, D. D.: Quantitative Clinical Chemistry, Baltimore, Williams & Wilkins Company, 1: 544, 547, 1932.
8. Hufner, G.: Arch. Anat. Physiol. 1907.
9. Chang, H. C., and Harrop, G. A., Jr.: J. Clin. Investigation 5: 393 (April) 1928.

V 106
1936

A, B, C and D respectively for the first menstrual cycle to 14, 13.92, 13 and 14.3 Gm. for the last cycle in the study. There is a possible significance of these increases, since they suggest a storage of measurable amounts of iron from a diet containing only the usual standard recommendation for this mineral but well fortified in other dietary essentials.

The red cell count remained remarkably constant for all subjects throughout the experiment. In one case when 5 mg. of iron from ferric ammonium citrate was given daily during two menstrual cycles the red cell content increased 0.5 million per cubic millimeter and the hemoglobin content increased 1 Gm. per hundred cubic centimeters. These higher values were not maintained when the citrate was discontinued.

From the data presented it appears that there is no definite or consistent measurable effect of the process of menstruation on the daily values of either hemoglobin or red cells in the subjects studied. Although occasional marked daily variations in the blood values occur, they do so irrespective of the different phases of the menstrual cycle.

The results of this study emphasize the fact that the existence of normal daily variations in hemoglobin and red cell count, even in subjects under controlled conditions, must be recognized when one judges the significance of single determinations or the influence of the menstruation process on these blood constituents.

CHLOROSIS

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Textbooks today describe chlorosis as a disease of unknown etiology which has disappeared mysteriously. In order to define chlorosis, therefore, it is necessary to refer to descriptions written at the time when the disease was most prevalent. Although the classic account by Johannes Lange in 1554 [1] referred to the disease of virgins "De Morbo Virgineo" as a well known entity, and although Sydenham (1661) and Willis (1681) described the efficacy of iron therapy in the disease, the years associated with its popular recognition were from 1830 to 1900. In 1836 Ashwell [2] described fifteen cases of chlorosis characterized by anemia appearing in adolescent girls, invariably associated with menstrual irregularity and often complicated by gastro-intestinal or pulmonary "affections." He also commented on their depraved appetite and insufficient diet. Most accounts during the nineteenth century were in accord with the description by Ashwell. It is evident that, in addition to anemia, a number of the patients had peptic ulcer or tuberculosis. Thus Bramwell,[3] in 1899, reviewing 314 typical cases wrote: "Epistaxis occasionally occurs, but other haemorrhages are rare except in those cases in which haematemesis results from associated ulceration of the stomach. . . . The anaemic condition undoubtedly predisposes to the production of the ulceration."

Later descriptions were more precise in the definition of chlorosis. Von Noorden [4] in 1905 described it as "a disease common at puberty and throughout the succeeding ten years, occurring in the female sex, characterized by anemia, spontaneous in origin." In reviewing 217 cases he cited a considerable number arising in the same family. Besides symptoms referable to anemia, a very large number suffered from gastro-intestinal disturbances, such as anorexia, epigastric pain, vomiting and constipation. Analysis of the symptomatology of his cases in addition to those of other authors discloses no unanimity of opinion regarding gastric acidity and menstrual disorders in chlorosis. In the majority there appeared to be normal or increased gastric acidity and likewise irregular or scanty menses. However, it is also evident from many observations that hyperacidity or scanty menses were not necessary attributes of chlorosis; likewise, that the green color was by no means essential to the diagnosis.[5]

In 1923 Campbell [6] reviewed the symptomatology of 104 cases that had entered Guy's Hospital between 1888 and 1922. His description of the disease agreed in the main with von Noorden's, and he also pointed out that an appreciable number had low gastric acidity and that in some instances the symptoms persisted several years.

Consequently the definition of chlorosis is not based on exact criteria. At best it may be defined as hypochromic anemia in adolescent girls or young women, usually associated with gastro-intestinal and menstrual disorder.

THEORIES OF PATHOGENESIS

There have been many different explanations for the occurrence of chlorosis. Prominent among them are deficient development of the vascular system, constitutional weakness of the blood-building organs, ovarian insufficiency, digestive disturbances due to reflexes from the developing female sex organs, and neurosis or gastroptosis. None of these are tenable, since the disease is readily corrected by the administration of iron. A sound and little appreciated critical treatise was written by Stockman [7] in 1895, who believed that all other factors were but contributory and predisposing to two great and direct causes; "namely, blood loss and insufficient supply of iron by the food." In his analysis of three cases he found the iron intake to average between 1.3 and 3.2 mg. daily. "Whereas the menses may not have been excessive, such a loss was relatively great and poorly sustained when the intake was deficient in iron. . . . Further, girls develop with extreme rapidity from 15 to 18, throwing a great strain on the organism, which suffers in various ways besides in blood forming."

Because of the supposed rarity of chlorosis and the apparent mystery that still enshrouds its etiology, four cases that entered this clinic in the past two years are presented. Since this hypochromic anemia responded readily to the administration of iron, study of causes for iron deficiency in these patients was made. In general our observations support the contention of Stockman

From the Thorndike Memorial Laboratory, Second and Fourth Medical Services (Harvard), Boston City Hospital, and the Department of Medicine, Harvard Medical School.

1. Lange, Johannes: De Morbo Virgineo, Epistola XXI, Medicinalium epistolarum miscellanea, Basle, 1554, p. 74; quoted by Major, R. H.: Classic Descriptions of Disease, Baltimore, C. C. Thomas, 1932, p. 444.

2. Ashwell, D.: Observations on Chlorosis, and Its Complications, Guy's Hosp. Rep. 1: 529, 1836.

3. Bramwell, B.: Anaemia and Diseases of the Blood-Forming Organs and Ductless Glands, Edinburgh, Oliver & Boyd, 1899, pp. 22-25.

4. von Noorden, Carl, in Nothnagel: Encyclopedia of Practical Medicine, Philadelphia, W. B. Saunders Company, 1905, p. 337-536.

5. Allbutt, T. C., in Allbutt, T. C., and Rolleston, H. D.: A System of Medicine, ed. 2, London, Macmillan & Co., Ltd. 5: 681-727, 1909.
Cabot, R. C., in Osler, William, and McCrae, Thomas: Modern Medicine, Philadelphia, Lea & Febiger 4: 639-648, 1908.

6. Campbell, J. M. H.: Chlorosis: A Study of the Guy's Hospital Cases During the Last Thirty Years, with Some Remarks on Its Etiology and the Causes of Its Diminished Frequency, Guy's Hosp. Rep. 73: 247 (July) 1923.

7. Stockman, R.: Observations on the Causes and Treatment of Chlorosis, Brit. M. J. 2: 1473, 1895.

that chlorosis is attributable to insufficient intake of iron, to blood loss and to the demands for iron made by growth.

CLINICAL ASPECTS

Two of the patients were 15 years of age and two were 16. In two cases the mother was definitely anemic before the birth of the patient and one of the mothers now has a pronounced chronic hypochromic anemia with achylia, glossitis, dysphagia and koilonychia. The mother of the third patient was and is definitely underweight, but there is no record of the blood picture. The grandmother of the fourth patient was treated for anemia twenty years previously at this hospital. There is no record of the mother's blood picture.

Dietary histories were taken carefully in all four cases. Their appetites were uniformly poor and capricious, and their diets had been markedly deficient in meat, green vegetables and fruit for several years. The iron contents of the diets were estimated at 4.9, 5.4, 6.9 and 6.8 mg. daily, in contrast to the normal of about 15 mg.

In no case was there complaint of dyspepsia, nausea, vomiting or diarrhea, but the lack of appetite and particularly the lack of iron-containing foods in the diet was pronounced.

Gastric analysis was performed on the four patients. In one there was normal gastric secretion. In two there was free gastric acidity only after the injection of histamine. The fourth patient had post-histamine anacidity. This was the daughter of the patient who now has chronic hypochromic anemia and achylia. Stool examinations were uniformly negative for blood.

Symptoms arose in three of the patients one year and in one patient two years after the onset of the menses. In two cases the menses came at intervals of twenty-eight days with moderate flow for four days each; in one case at intervals of three weeks with excessive flow for one week; in another the intervals were seven weeks apart, with moderate flow for one week. In addition to the loss of blood during the menses, two patients gave a history of recurrent nosebleeds for several years without apparent local cause.

All four cases exhibited characteristic blood pictures of chlorosis with hypochromic microcytic anemia.

ANALYSIS OF FACTORS RESPONSIBLE FOR IRON DEFICIENCY

(*a*) *Growth.*—The growth of these patients, as determined by the height-weight gains recorded in their school reports, was normal except in case 1, in which growth was very rapid, with a gain in body weight of 19 pounds (8.6 Kg.) in twenty-one months preceding entry to the hospital. With growth there is an increase not only in body surface but also in circulating blood volume. The blood volume may be approximated as 2,430 times the body surface at 14 years of age.[8] In the average 14-year old girl this amounts to 3,650 cc. of blood, and at the age of 15 years to 3,990 cc., an increase of 340 cc. There is a gain also in extracirculatory tissue iron at this age, which provides an additional demand during growth and which may be judged equivalent to about one-tenth the circulating blood iron.

(*b*) *Blood Loss.*—In two patients the menses were normal, in one they were increased and in one they were scanty. Whereas statistics of menstrual loss are widely variant, a conservative estimate is 50 cc. per period, or 650 cc. annually. This corresponds to a daily loss of about 1 mg. of iron throughout the year.

Consequently, when one adds to the growth requirement of 340 cc. of blood from 14 to 15 years of age the average annual menstrual loss of 650 cc., the total 990 cc. of blood becomes a sizable drain on the iron store of a patient with an insufficient dietary intake.

Finally, nosebleeds provided an added insult to the depleted blood reserve in two cases. Thus patient 2 lost about two tablespoonfuls every month, or an annual loss of about 360 cc., and patient 3 lost about one cupful three times yearly, an annual loss of about 375 cc.

(*c*) *Diet.*—It has been shown that a daily diet containing 5 mg. of iron is adequate to maintain iron balance in the adult male and to maintain a normal hemoglobin level over a long period of time.[9] It has also been shown that only a portion of the food iron is available for hemoglobin production in experimental anemia of rats,[10] and, although similar studies have not been reported on man, the evidence is clear that analogous conditions exist. It is likely, then, that the adult male needs considerably less than 5 mg. of iron as such daily for maintenance. Indeed, Lintzel's[11] studies suggest that balance can be maintained in the normal man with an iron intake of less than 1 mg. daily.

TABLE 1.—*Average Daily Diet of Case 4*

	Food	Mg. of Iron
Breakfast	Tea	0.03
	Sugar	0.02
	Cream	0.07
	Bread	0.70
Luncheon	Bread	1.38
	Butter	0.02
	Fruit	0.41
Supper	Bread	0.70
	Potato	0.60
	Butter	0.02
	Meat	0.39
	Vegetable	0.35
	Milk	0.42
		5.01

In adolescent girls, however, growth and blood loss increase the iron requirement well above that of the adult male, and when further hemoglobin production is demanded in the face of an established anemia still greater iron intake is obviously needed. A typical diet of the four chlorotic patients is recorded in table 1, which is the average daily diet in case 4 with iron equivalents estimated according to the analyses of foods by Toscani and Reznikoff.[12] Theoretically an iron intake of 5.4 mg. could satisfy the maintenance needs of this patient, but with only a portion of the food iron available such a diet could not efficiently make up the hemoglobin deficit. Indeed, an optimal diet is barely helpful in overcoming chlorotic anemia. For example, patient 2 was given a diet rich in iron and protein for twenty days, during which time the hemoglobin rose from 30 to 36 per cent. Directly after this period 3 Gm. of ferric ammonium citrate was administered daily and there followed a rise of hemoglobin from 36 to 73 per cent in sixteen days.

8. Heath, C. W., and Patek, A. J., Jr.: Iron Deficiency Anemia, to be published.

9. Farrar, G. E., Jr., and Goldhamer, S. M.: The Iron Requirement of the Normal Human Adult, J. Nutrition **10**: 241 (Sept. 10) 1935.

10. Sherman, W. C.; Elvehjem, C. A., and Hart, E. B.: Further Studies on the Availability of Iron in Biological Materials, J. Biol. Chem. **107**: 383 (Nov.) 1934.

11. Lintzel, W.: Zur Frage des Eisenstoffwechsels; ueber den Eisenbedarf des Menschen, Ztschr. f. Biol. **88**: 342, 1929.

12. Toscani, V., and Reznikoff, Paul: The Iron Content of Foods Used in a Municipal Hospital, J. Nutrition **7**: 79 (Jan.) 1934.

V 106
1936

It appears, therefore, that an iron-poor diet is important not in the direct causation of anemia but rather in the failure to restore normal hemoglobin in anemia occasioned by growth and blood loss.

After the normal hemoglobin concentration has been reached with inorganic iron therapy, a suitable diet is probably adequate to supply the usual maintenance needs. Thus, after reaching a normal hemoglobin concentration with iron, patient 3 has maintained this level for nine months with a good diet and no iron.

COMMENT

It is apparent from the analysis of these cases that insufficient intake of iron, loss of iron by menstrual and other blood loss, and the demands for iron by a growing organism are three important factors in the production of chlorosis. It is also interesting to note that in at least two of the four cases definite evidence of anemia of the mothers was obtained. It is not unlikely that these patients inherited a meager iron store at birth [13] and that in childhood they may have had a larval chlorosis, which reached a clinical level when the limited iron store was taxed by menstruation and by the demands for iron made by growth. In chlorosis there may therefore be a "constitutional" factor in the sense of a poor iron storage endowment.

It is interesting to speculate on the rarity of the disease now as compared to its common prevalence some years ago. Part of this decline in incidence is only apparent. With the advent of x-ray examinations and of tests for the detection of occult blood in the stool (1900-1904) many cases of so-called chlorosis would now be attributable to tuberculosis or peptic ulcer. This has been pointed out by von Hoesslin [14] and von Willebrand.[15] With accurate measures for hemoglobin determination introduced in 1902 (Sahli) a group of patients considered pale would now be found to have normal hemoglobin and would be considered to have one or another nervous disorder.

However, even with the elimination of such faulty diagnoses there probably did exist a large number of cases of chlorosis. The environmental changes and the emancipation of women from a cloistered sedentary life which has taken place undoubtedly lead to a better appetite and to a diet richer in iron-containing foods.

In contrast to the rarity of severe forms, mild degrees of chlorosis are now very common.[16] In the routine examination of student nurses between the ages of 18 and 23 at this hospital it was found that 26 per cent of thirty-eight girls considered healthy had moderate anemia, with hemoglobin between 70 and 79 per cent (Sahli).

Of interest is the common finding now of hypochromic anemia in middle-aged women, particularly since Faber's [17] description of the syndrome in 1909. The popular recognition of this syndrome following the decline of adolescent chlorosis might indicate perhaps a shift toward a later age group. Frequently these patients give the history of having been pale or anemic in girlhood. It is impossible at present to define the relationship between the two conditions. Witts [18] makes a sharp clinical distinction based on the finding of gastric acidity in chlorosis and of achylia gastrica and glossitis in the older age group. Bloomfield,[19] however, argues that such distinctions are unwarranted and arbitrary.

There can be no doubt that the four cases presented here correspond closely to early descriptions of chlorosis. It is our opinion that the disease has not disappeared. Since its cause depends on conditions that are universally current, such as growth, blood loss and inadequate diet, it is unlikely that it should disappear.

CONCLUSIONS

1. Chlorosis has not disappeared.
2. In the analysis of factors responsible for anemia in four cases of chlorosis, definite cause for iron deficiency was shown.
3. Chlorosis is the exaggeration of a normal tendency toward anemia in adolescent girls, created by the increased demand for iron made by growth and by menstrual or other blood loss, and by diet insufficient in iron-containing foods.

REPORT OF CASES

CASE 1.—A girl, aged 15 years, in November 1935 complained of shortness of breath and weakness. Her father had tuberculous adenitis. Her mother was anemic at the time of the patient's birth. In childhood the patient was underweight and was subject to frequent colds. Her appetite had been capricious and her diet had been poor in iron-containing foods during the past three years. In the twenty-one months preceding entry growth was rapid, with a gain of 19 pounds (8.6 Kg.).

TABLE 2.—*Initial Blood Counts in Four Cases of Chlorosis*

Case	Red Blood Cells per Cu. Mm.*	Hemoglobin, per Cent	Hematocrit, per Cent	Mean Corpuscular Volume, Cu. Mic.	Mean Corpuscular Hemoglobin Concentration, per Cent	White Blood Cells per Cu. Mm.	Differential Leukocyte Count, per Cent: Polymorphonuclears	Lymphocytes	Monocytes	Eosinophils
1	4,888,000	34	....	....	....	6,200	80	15	14	1
2	5,370,000	39	37.4	72.4	26	7,800	75	18	6	1
3	5,420,000	64	52.9	74.9	27	10,200	87	7	5	0
4	4,600,000	60	51.0	84.7	28.6	7,200	68	20	10	1

* The red blood cells in all cases were pale and small. They showed marked variation in shape. Blood platelets were normal.

In February 1934 several x-ray examinations of the chest were made, but no abnormality was noted. In November 1934 the catamenia began, and the menstrual periods have since recurred at twenty-eight-day cycles with four days of moderate flow. In October 1935 the patient complained of weakness, headache, palpitation and shortness of breath. There was no history of bleeding or of any disorder of the gastro-intestinal or genito-urinary tract.

The patient was very pale and tired looking. Several teeth were decayed. The papillae of the tongue were normal. The lungs and heart were normal. A soft systolic murmur was heard in the area of the pulmonary valve. Examination of the abdomen, pelvis and rectum showed no abnormality. The finger nails were thin, flat and brittle. The reflexes were physiologic.

The urine and stools were normal. Gastric analysis revealed normal gastric secretion. The blood Kahn reaction was negative. Details of the blood counts are given in table 2.

The patient improved rapidly with iron therapy. In one month the hemoglobin rose from 34 to 66 per cent. The patient felt well.

CASE 2.—A girl, aged 16 years, entered the hospital in February 1934 because of weakness. Her grandmother had

13. Strauss, M. B.: Anemia of Infancy from Maternal Iron Deficiency in Pregnancy, J. Clin. Investigation **12**:943 (March) 1933.
14. von Hoesslin, H.: Zur Abnahme der Chlorose, München. med. Wchnschr. **73**:853 (May 21) 1926.
15. von Willebrand, E. A.: Der Gesundheitszustand bei Personen, die früher an Chlorose gelitten haben, Acta med. Scandinav. (suppl.) **8**: 257, 1922.
16. Davidson, L. S. P.; Fullerton, H. W., and Campbell, R. M.: Nutritional Iron-Deficiency Anaemia, Brit. M. J. **2**:195 (Aug. 5) 1933.
17. Faber, K.: Achylia gastrica mit Anämie, Med. Klin. **5**:1310, 1909.
18. Witts, L. J.: Simple Achlorhydric Anaemia, Guy's Hosp. Rep. **80**: 253 (July) 1930.
19. Bloomfield, A. L.: Relations Between Primary Hypochromic Anemia and Chlorosis, Arch. Int. Med. **50**:328 (Aug.) 1932.

been treated for anemia twenty years before. In childhood the patient enjoyed robust health. On moving from the country to the city two years before, the family lived in cramped lodgings. The patient's appetite failed and she developed a dislike particularly for meat and green vegetables. For several years, moderate nosebleeds occurred on the average of once a month. For one year menstruation came at cycles of three weeks with excessive flow for one week. Two weeks before entry the patient fainted.

On examination she was thin, extremely pale and listless. The teeth were carious. The nose showed no bleeding point or ulceration. The papillae of the tongue were normal. The lungs were clear and the heart was normal except for a rapid rate and a systolic murmur in the area of the mitral valve. The remainder of the examination was negative.

The urine and stools were normal. Gastric analysis yielded only a trace of free hydrochloric acid after the injection of histamine. The blood Kahn reaction was negative. Detailed blood counts are listed in table 2.

With iron therapy the red blood cells increased from 2,370,000 to 4,370,000 and the hemoglobin from 29 to 87 per cent. The menstrual periods now appear at twenty-eight-day cycles with average flow. Occasional nosebleeds recur. The diet is ample and the patient feels strong. A normal blood level has been maintained four months without iron therapy.

Case 3.—A girl, aged 15 years, entered the hospital in February 1935 because of pneumonia, from which she promptly recovered by crisis. Born and brought up on a farm, the patient was in sound health until her family moved to the city. At 9 years of age, because of ill health, the patient returned to the farm for two years. Since she was 9 years of age, rather severe nosebleeds had occurred about three times a year. The menses began at 12 years and have persisted up to the present time in cycles of seven weeks with one week of moderate flow. Her appetite had been poor for several years and her diet very sparing in iron-containing foods. For two years she had been noticeably pale. For one year she had complained of palpitation, precordial ache and easy breathlessness.

The signs of pneumonia in the left lower lobe disappeared after several days. Except for pallor there were no physical abnormalities.

Urine and stool examinations were negative. Gastric analysis showed only 7 units of free hydrochloric acid after the injection of histamine. The blood Kahn reaction was negative. Detailed blood counts are listed in table 2.

With iron therapy and a suitable diet the patient made rapid recovery. The hemoglobin increased from 44 to 87 per cent in six weeks. Although no iron has been taken for nine months, the patient's hemoglobin is now 96 per cent. She feels well. The lungs were normal. The heart was not remarkable except for a rapid rate and a systolic murmur heard all over the precordium. Examination of the abdomen, pelvis, rectum and extremities showed no abnormalities. The reflexes were physiologic.

The urine and stools were normal. Gastric analysis showed complete absence of free hydrochloric acid after the injection of histamine. The blood Kahn reaction was negative. Initial blood counts are listed in table 2.

With iron therapy recovery was prompt, with a rise of hemoglobin from 40 to 81 per cent in two months. For one year normal values have been maintained with small amounts of iron, and for the past seven months without iron. Gastric analysis repeated one year after entry showed a return of free hydrochloric acid without the stimulus of histamine. Her diet is now ample in iron-containing foods, and she feels well.

Clinical Notes, Suggestions and New Instruments

A RULER FOR DETERMINATION OF ELECTROCARDIOGRAPHIC VALUES

Zolton T. Wirtschafter, M.D., Cleveland

A transparent celluloid ruler measuring 15 by 4 cm. has been devised, which enables one to determine auricular and ventricular rates and PR and QRS intervals directly from electrocardiographic tracings. The method generally employed at present involves the use of dividers, counting time intervals and subsequent mathematical calculations, for the determination of these values, especially rates. This comparatively cumbersome procedure, at its best, often leads to errors.

The principle on which this ruler was devised is quite simple. The motor speed of most electrocardiograph machines is so adjusted that 2.5 cm. of film is exposed per second. Hence, a record is produced in which the large interval, representing 0.20 second, covers a distance of 0.5 cm., while the small division, representing 0.04 second, extends over a distance of 0.1 cm. On this basis one can easily calculate the space covered by a single cardiac cycle at any heart rate. These values for a selected number of cardiac rates have been calculated and, as seen in the accompanying illustration, vertical lines have been constructed at the corresponding distances from an abscissa at the left end of the rate scale.

The rate scale is employed in the following manner: To determine the ventricular rate, the ruler is placed over the electrocardiographic tracing so that the abscissa at the left side of the rate scale coincides with point R (apex or sharp peak of ventricular complex). The corresponding point of the next cycle will coincide with the reading for the ventricular rate at that particular point in the record. The auricular rate can be determined similarly by using the apex of the auricular wave (P) instead of point R. By repeating this process at various parts of the record, any arrhythmia quickly becomes apparent.

On the same basic principle, PR and QRS scales have been included in the ruler; i. e., 1 mm. is equivalent to 0.04 second. Thus, when the zero line of the PR scale is placed over the

Ruler for determination of electrocardiographic values.

Case 4.—A girl, aged 16 years, entered the hospital in November 1933 because of excessive weakness of several months' duration. Her mother had chronic hypochromic anemia with achylia gastrica, glossitis and koilonychia. For several years the patient's appetite had been poor and her diet had been sparing in meat, green vegetables and fruit. Catamenia began at 14 years with the menses appearing at twenty-eight-day cycles and lasting from three to four days, with moderate flow. There was no history of bleeding or of any disorders of the gastro-intestinal or genito-urinary tract.

The patient was well developed but slim, and her skin had an olive gray pallor. The teeth were in poor repair. The tonsils were hypertrophied. The papillae of the tongue were normal.

From the department of medicine, Mount Sinai Hospital.

V 106 1936

beginning of the P wave, the end of the PR interval coincides with the time value of the interval on the scale. The lines for the limits of normal, namely, 0.12 and 0.20 second, are made heavier. In a similar manner, when the zero line of the QRS scale is placed over point Q, point S coincides with the time value of the QRS interval on the scale. Again, as in the PR scale, the limits of normal of the QRS interval, 0.04 and 0.10 second, are indicated by heavier lines.

An ordinary metric scale is placed along one edge of the ruler. In addition to the usual uses of a metric scale, it is intended to be employed to measure the height (voltage) of the various complexes.

In some cases, because of the haziness of the tracing, some difficulty may be encountered in attempting to visualize the record clearly through portions of the ruler. This may be obviated by holding the ruler at a 45 degree angle with the surface of the record, reading the beveled edge of the ruler instead of reading through the celluloid. Indeed, several cardiologists who have employed the instrument prefer to use it in this manner at all times.

Examination of a large number of electrocardiographic tracings has revealed that approximately 85 per cent of all records may be accurately interpreted with this instrument. The motor speeds of the other machines vary somewhat from the standard mentioned. However, it is possible to adjust the speed of these motors to conform with the standard rate. One can quickly determine whether the ruler may be used on records from any individual apparatus by measuring the distance covered by two of the large time intervals, which distance should equal 1 cm.

The utilization of this ruler enables one to interpret an electrocardiographic tracing with greater facility than the present methods allow. Errors in mathematics are largely eliminated, since no calculation is necessary.

908 Keith Building.

A BRACE FOR THE TRANSPORTATION AND HANDLING OF PATIENTS WITH INJURIES OF THE CERVICAL VERTEBRAE

LOUIS T. WRIGHT, M.D., NEW YORK

There has been no brace designed to my knowledge for the transportation and handling with safety of patients with acute fractures and dislocations of the cervical vertebrae. The only

Fig. 1.—Appearance of the brace.

point stressed in making this brace was that it should be so solidly and firmly constructed that it would not slip once it had been applied. It is adjustable, and any degree of hyperextension and traction on the head is easily obtained by means of four turnbuckles.

The necessity for such a brace occurred to me because we had in the wards several patients with injuries of the cervical spine whom we were afraid to move for roentgen examination for fear that harm might result. It was therefore with the idea of supporting the neck during roentgen examinations in these cases that this brace was made, and for that reason the obliquely vertical rods were placed so as not to interfere with the lateral and anteroposterior x-ray views.

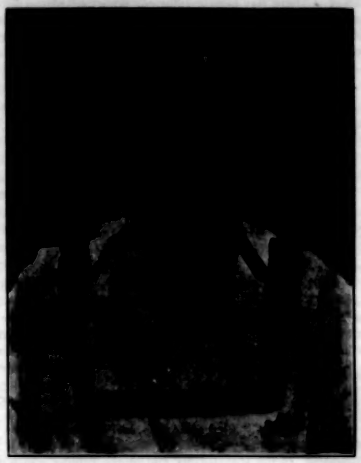

Fig. 2.—Anteroposterior view of the brace when applied.

It subsequently occurred to me that the use of such a splint might possibly prove of value in the transportation of a patient with an injured cervical spine to the hospital if applied by an ambulance surgeon at the scene of the accident. The chin piece

Fig. 3.—Lateral view of the brace when applied.

is so arranged that it can be turned down out of the way when it is necessary to take a roentgenogram through the open mouth, as is the case in fractures of the atlas and axis. I make no claim for originality, as doubtless a similar apparatus has been in use, although I do not know of it. The Thomas collar and

From the Surgical Service of Harlem Hospital, Dr. C. S. B. Cassasa, Director.

the Young head piece attached to the Taylor brace will maintain a certain degree of hyperextension of the head, but they are used during the convalescent period, after reduction and plaster cast immobilization; and they are too unstable to depend on during the acute dangerous period when further displacement may occur. There has been insufficient emphasis placed on the management of this phase in the treatment of these injuries, and if this note stimulates an added interest in this special problem it will be more than worth while.

218 West One Hundred and Thirty-Ninth Street.

Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT. HOWARD A. CARTER, Secretary.

COMPREX SHORT WAVE DIATHERMY UNIT ACCEPTABLE

Manufacturer: Comprex Oscillator Corporation, New York.

This unit is recommended by the manufacturer for medical and surgical diathermy. Standard equipment includes cuff electrodes and attachments for tissue cutting and coagulation.

The machine is of the two-tube oscillator type, with a patient circuit inductively connected to the tank circuit. The power input is about 660 watts, and the wavelength between 15 and 16 meters. Since there is no acceptable method for measuring the output power of diathermy machines, this value is not stated. Operating the unit under full load for two hours indicated that the temperature rise of the transformer and of the cabinet was within the limits of safety established by the Council. The shipping weight is about 52 pounds. Figure 2 is a diagram of the circuit.

Fig. 1.—Comprex Short Wave Diathermy Unit.

The tissue heating ability of the machine was investigated and the evidence submitted was verified in a clinic acceptable to the Council. Cuff electrodes, about 6 cm. wide and about 57 cm. long, were used. When applied to the patient, the cuffs were separated from the skin by about 1.7 cm. spacing, consisting of cellucotton pads. The distance between the center of the cuffs is about 20 cm. Thermocouples were introduced into the subcutaneous and deep-lying tissues (quadriceps extensor) of the human thigh. The machine being operated at the patient's tolerance, the temperature rise (average of eight tests) was observed at the beginning and end of twenty-minute application periods, the thermocouples being removed during the treatment. According to the results of this test, the temperature rise of the deep-lying tissues of the thigh was higher than that obtained with conventional diathermy—the criterion for evaluating short wave machines which the Council has adopted.

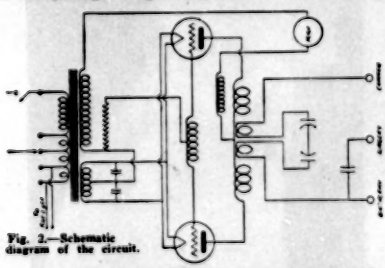

Fig. 2.—Schematic diagram of the circuit.

In a clinic acceptable to the Council, this apparatus was used for fever treatment. If the proper technic is used under the supervision of a qualified physician, this device may be expected to produce hyperpyrexia. The physician should safeguard the patient by using safety methods employed in operating rooms for major surgery.

In view of the favorable clinical performance of the machine when using the cuff electrodes, the Council on Physical Therapy voted to include the Comprex Short Wave Diathermy Unit in its list of accepted apparatus.

Council on Pharmacy and Chemistry

HISTIDINE HYDROCHLORIDE

IN THE CONSIDERATION OF A COMMERCIAL PREPARATION OF *l*-HISTIDINE MONOHYDROCHLORIDE (LABORATOIRE-"ROCHE") PROPOSED FOR USE IN THE TREATMENT OF PEPTIC ULCER, THE COUNCIL ON PHARMACY AND CHEMISTRY WAS CONFRONTED WITH THE PROBLEM OF THE THERAPEUTIC VALUE OF THE DRUG IN THIS CONDITION. AT THE REQUEST OF THE COUNCIL'S REFEREE A STUDY WAS MADE BY DR. KIRBY A. MARTIN OF THE SYMPTOMATIC AND RADIOLOGIC RESPONSE OF A SERIES OF FORTY-ONE PATIENTS TREATED WITH A SOLUTION OF HISTIDINE MONOHYDROCHLORIDE AS COMPARED WITH THAT OF FORTY PATIENTS TREATED WITH THE USUAL DIET-ALKALI REGIMEN. THE RESULTS ARE REPORTED IN THE FOLLOWING PAPER, WHICH DR. MARTIN SUBMITTED FOR THE COUNCIL'S CONSIDERATION. THE COUNCIL ADOPTED DR. MARTIN'S REPORT, AUTHORIZING IT FOR PUBLICATION WITH EXPRESSIONS OF HIGH APPRECIATION OF THE EXCELLENT WORK DONE BY THE INVESTIGATOR. THE COUNCIL POSTPONED FURTHER CONSIDERATION OF HISTIDINE HYDROCHLORIDE TO AWAIT ADEQUATE CLINICAL EVIDENCE OF ITS THERAPEUTIC VALUE.

PAUL NICHOLAS LEECH, Secretary.

HISTIDINE HYDROCHLORIDE VERSUS DIET AND ALKALIS IN TREATMENT OF PEPTIC ULCER

THE IMMEDIATE AND LATE EFFECTS IN FORTY-ONE CASES

KIRBY A. MARTIN, M.D.
NEW YORK

Since the use of histidine hydrochloride in the treatment of peptic ulcer was introduced by Weiss and Aron in Strasbourg in 1933,[1] a widespread interest has been aroused in this substance. Increasing numbers of communications have appeared in the literature, first in Europe and more recently in this country, and for the most part these reports lend great encouragement to histidine therapy as a means of treating this perplexing condition. While the etiology of peptic ulcer still remains obscure, the present high standard of diagnostic accuracy enables one to establish a fairly correct criterion by which therapeutic substances may be judged. It seemed desirable, therefore, to study the results of histidine therapy on a selected group of patients with peptic ulcer, with the intention of observing not only the immediate effects, as heretofore reported, but the sustained effects of this treatment.

The Strasbourg workers based their clinical observation on previous experimental investigation.[2] They reasoned that, since ulcers could be so readily produced in dogs by the Mann-Williamson technic,[3] the cause of

From the New York Hospital and the Department of Medicine, Cornell University Medical College.

1. Weiss, A. G., and Aron, E.: La carence en acides aminés non synthétisables dans la pathogénie de l'ulcère expérimental: application au traitement de l'ulcère humain, J. belge de gastro-entérol. **71**:327, 1933. Weiss, A. G.: La carence en acides aminés non synthétisables dans la pathogénie de l'ulcère expérimental: application au traitement de l'ulcère humain, Société belge de gastro-entérologie, Bruxelles-méd. **13**:1057 (July 16) 1933.

2. Weiss, A. G.; Aron, E., and Holtzmann, P.: Influence des injections d'acides aminés (tryptophane, histidine, lysine) sur la cicatrisation de plaies artificielles de la muqueuse gastrique, Compt. rend. Soc. de biol. **113**:1067, 1933. Weiss, A. G., and Aron, E.: Rôle des acides aminés dans l'évolution de l'ulcère expérimental: influence de l'histidine, Presse méd. **41**:1880 (Nov. 22) 1933. Aron, E.: Les résultats de l'application a la clinique de ces données expérimentales, Bruxelles-méd. **27**:1057 (July 16) 1933.

3. The Mann-Williamson (Mann, F. C., and Williamson, C. S.: The Experimental Production of Peptic Ulcer, Ann. Surg. **77**:409 [April] 1923. Mann, F. C.: Am. J. Surg. **71**:453 [Oct.] 1929) operation has for its object the diverting of the pancreatic juice and bile, together with the duodenal secretion, into the terminal ileum. This is accomplished by resecting part of the duodenum, anastomosing the distal end with the terminal ileum and closing the proximal end of the loop, the continuity of the stomach and the distal duodenal loop being restored by an end-to-end anastomosis.

V 106
1936

such ulcers might be the loss of some vital substance produced in the duodenum of that animal. Since some of the amino acids are normally produced in the duodenum by protein cleavage, they thought that an amino acid deficiency might occur in peptic ulcer and that erosion and ulceration might result from the acid chyme when the cells of the gastro-enteric walls were deficient in these vital substances. They decided to investigate the effects of some of the amino acids as a substitution therapy with the hope of preventing ulcers or healing those already produced.

Weiss and Aron carried out the Mann-Williamson technic on five dogs; two were kept as controls and the remaining three animals received daily intramuscular injections of histidine and tryptophan. (Later it was stated that tryptophan was without effect.) The control animals lost weight, had blood in the feces, and developed a severe anemia. One was killed at the end of three weeks and "four small ulcers were found." One died of a perforated jejunal ulcer in the sixth week. The three treated animals lost weight and were anemic, but no blood was found in the feces. The treated animals were killed, one at five weeks, one at six weeks, and one at ten weeks after the experiments were started. "No ulcer was found in any of these three animals. As a result of further experimentation it was pointed out that histidine treated animals later died of emaciation."

These workers concluded from their observations that tryptophan and histidine would prevent ulcer formation, although the animals became anemic and cachectic, and developed profuse diarrhea but without melena. They explained the beneficial effects of histidine as providing a substance that "betters the trophism of the gastro-enteric wall." They immediately tried either histidine or histidine and tryptophan on a few patients with peptic ulcer. They report that in all the cases the symptoms disappeared after a few injections but that in many of them the radiologic signs persisted. A preliminary report of a further series showed "rapid disappearance of vomiting and pain, intestinal hemorrhage rapidly checked, little or no effect on gastric acidity, x-ray changes variable—recent ulcers disappeared, the callous ones persisted, and the periodic crises were aborted." More recently Aron [4] has reported similar immediate effects in forty-two cases.

Fontès and Bauer [5] repeated the experimental work of Weiss and Aron but, instead of employing the parenteral method, gave the histidine orally in doses of from 0.25 to 0.5 Gm. daily. The procedure was carried out on 100 dogs and the formation of ulcer was prevented in 30 per cent. When ulcer did occur it was much smaller than that present in the untreated animals. They were unable to find any relation between the quantity of histidine ingested daily and the nonappearance of the ulcer. However, when they doubled the quantity of histidine ingested, the length of survival was almost doubled. The animals in which no ulcer was found eventually died. These authors questioned histidine as being the sole factor in the nonappearance of experimental ulcer.

Blum [6] was among the first to report the clinical benefits derived from histidine. He kept his patients on normal diets and found that the acute symptoms promptly improved. Lenormand,[7] Richards,[8] Stolz,[9] Bogendoerfer,[10] Hessel [11] and others have similarly reported the initial benefits observed from this therapy, but the number of cases studied was small and the follow up insufficient. Bulmer [12] reported fifty-two unselected cases of peptic ulcer treated with histidine. All but three of the patients were kept ambulatory. His immediate results were (1) thirty symptomatic cures with disappearance of the abnormal roentgen observation, (2) ten symptomatic cures with persistence of some roentgen abnormality, and (3) twelve failures. No appreciable change in gastric acidity was noted. Later, three patients relapsed. Cases of gastric ulcer seemed to him to be more amenable to this treatment than did those of duodenal ulcer. A few of his patients were followed as long as ten months.

In this country, Volini and McLaughlin [13] have made a preliminary report on twenty-one patients with peptic ulcer who were treated with histidine. All their patients were kept ambulatory and on "liberal diets" but were detailed at duties in the hospital. These investigators reported rapid clinical improvement, characterized by the relief of pain, vomiting, hypersecretion and gastric retention. Appetite and weight increase was noted. Eads [14] made a preliminary report on thirty-five cases of peptic ulcer (thirty duodenal and five gastric) treated with histidine. All his patients were kept ambulatory and on "slightly modified diets." His results were clinical and x-ray evidence of immediate healing in six cases, the same evidences of improvement but less rapid in eight cases, amelioration of symptoms with x-ray examinations unchanged in nine cases, and no improvement in twelve cases. The author reports less beneficial effect than is recorded in previous papers. His observations extended over six months.

Rafsky [15] reported twenty-four duodenal, one marginal and one gastric ulcer treated with histidine. Most of his patients were confined to bed. The diet varied from a "Sippy to a regular diet." He observed marked diminution of acidity. Symptomatic relief was obtained during treatment in nineteen of his patients, all of whom remained symptom free during his observation extending over four months. He did not estimate what effect bed rest and change of diets might have had on his patients.

HISTIDINE

Histidine was discovered by Kossel in 1896 among the decomposition products of the protamine of sturgeon testes, but it was not until 1904 that its structure was definitely determined by Pauly Wendhouse and Knopp.[16]

Histidine is a constituent of most of the simple proteins and may be obtained from a great variety of foodstuffs, most important of which are beef, eggs, fish

4. Aron, E.: Treatment of Gastroduodenal Ulcer by Histidine, Presse méd. 43: 1195 (July 27) 1935.

5. Fontès, G., and Bauer, H.: Action de l'ingestion d'histidines sur l'ulcère expérimental du chien, Compt. rend. Soc. de biol. 118: 69, 1935.

6. Blum, P.: Orientation nouvelle de la pathogénie de l'ulcère expérimental gastrique et de la therapeutique de l'ulcère humain, Bull. gén. de thérap. 184: 253 (June) 1933.

7. Lenormand, J.: Acidothérapie aminée et épigastralgies de cause non ulcéreuse (action de l'histidine), Gaz. d. hôp. 107: 255 (Feb. 21) 1934.

8. Richards, W. D.: Résumé of Surgery, the Hahnemannian Monthly 70: 191, 1935.

9. Stolz, A.: Traitement de l'ulcus gastroduodénal par l'histidine, Bull. mém. Soc. nat. de chir. 61: 245 (Feb. 23) 1935.

10. Bogendoerfer, L.: Neuartige Ulkusbehandlung mit einem Histidin-Praeparat, München. med. Wchnschr. 81: 1270 (Aug. 17) 1934.

11. Hessel, Georg: Die Behandlung des Magen- und Zwoelffingerdarmgeschwuers mit Histidin, München. med. Wchnschr. 81: 1890 (Dec. 6) 1934.

12. Bulmer, Ernst: The Histidine Treatment of Peptic Ulcer, with a Note on Fifty-Two Cases, Lancet 2: 1276 (Dec. 8) 1934.

13. Volini, I. F., and McLaughlin, R. F.: The Histidine Monohydrochloride Therapy of Gastroduodenal Ulcer: A Preliminary Report, M. Rec. 141: 364 (April 17) 1935.

14. Eads, J. T.: Histidine in the Treatment of Peptic Ulcer: A Preliminary Report, Am. J. Digest. Dis. & Nutrition 2: 436 (Sept.) 1935.

15. Rafsky, H. A.: Injection Treatment of Peptic Ulcer with Special Reference to the Use of Histidine Monohydrochloride, M. Rec. 142: 289 (Sept. 18) 1935.

16. Underhill, F. P.: The Physiology of the Amino Acids, New Haven Conn., Yale University Press, 1916.

and milk. It is found in much larger quantities in blood and it is from this source that it is derived commercially.

It seems to be a fairly established fact that certain of the amino acids—for example, tryptophan and histidine—are indispensable for the maintenance of a normal nutrition. The animal organism does not possess the ability to synthesize histidine, nor can another amino acid replace it. On the other hand, there is no convincing evidence from feeding experiments that a deficiency of this substance can be produced in animals. The presence of histidine in foodstuffs is so universal that the exclusion of histidine-producing foods would make the diet incomplete in other indispensable dietary factors.[17]

Since histidine-containing proteins are always present in a normal diet, it follows that histidine must necessarily be a normal constituent of the intestinal contents. The absorption of the amino acids, either in their simplest form or as a more complex structure, is regarded as a normal process of digestion.

METHOD EMPLOYED IN THE PRESENT STUDY

Eighty-one patients with active symptoms of peptic ulcer and positive radiologic evidence were chosen from our clinic for this study. They were allotted impartially to one of two groups: (1) the histidine group and (2) the diet-alkali or control group.

Table 1.—*Immediate and Late Effects from Histidine Treatment in Peptic Ulcer: Forty-One Cases*

	Symptom Free			Crater or Persistent Symptoms		
				Crater		
	Ulcer Healed (X-Ray)	Ulcer Not Healed (X-Ray)	Total Cases	Before Treatment	After Treatment	Persistent or Recurring Symptoms
Immediate results at completion of injections...	14	12	30	23	22	11
Late results, from 4 to 12 months	10	3	13*	..	..	28
Patients operated on.....	..	..	..	..	..	4

* Trace lost of two of these patients.

Selection of Patients.—We considered the selection of patients of the utmost importance. The requirements of the study did not permit the selection of more than one in ten of the ulcer patients who came to the clinic. The patient's close residence to the clinic, his intelligence and cooperation, and his willingness to undertake such a time-consuming procedure were important factors. All the eighty-one patients were kept ambulatory and at their usual work, with the exception of three in the histidine series who were hospitalized because of the acuteness of their symptoms at the beginning of their treatment. Fairly young individuals in whom there were no concomitant organic diseases to obscure the clinical picture were given preference. All the cases selected were confirmed radiographically and in most instances a crater was visualized. More patients with duodenal ulcer than gastric ulcer were included because of the greater frequency and the chronicity of the former and the tendency of the latter to disappear, leaving no trace, regardless of the therapy used. No attempt was made to limit the ratio of the female to the male patients. The evidence presented suggested that the duration of the ulcers in this group varied from one to seven years. It is unusual in a large clinic to find a patient seeking relief for his ulcer symptoms who does not give a history indicating that his ulcer has existed for at least a year and in most instances for several years. It is also the rule rather than the exception that these patients have had one or more "medical cures" even though a positive diagnosis may not have been made before coming under our observation. Chronicity and rhythmicity are the rule and not the exception.

I do not wish to convey the impression that the patients chosen for this study were those with deep calloused ulcers, amenable only to surgical intervention. On the contrary, they were a medium young group with no demonstrable disease other than duodenal or gastric ulcers, and with acute symptoms that would be expected to react favorably to the usual diet-alkali regimen.

Management of Patients.—Patients of both groups were examined and treated in the routine way to eliminate as far as possible extrapsychogenic factors. They were examined by the various members of the staff; the daily injections were given by the nursing staff to those in the histidine group; the radiographic examinations were carried out by the regular staff of that department without knowledge as to which patients were included in this study.

HISTIDINE SERIES

There were forty-one patients in this group, thirty-two men and nine women. Thirty-eight had duodenal ulcer, two gastric ulcer and one marginal ulcer. Their ages ranged from 18 to 62 years, averaging 37 years. The histidine [18] (4 per cent aqueous, isotonic histidine hydrochloride) was given intramuscularly in 5 cc. doses daily (omitting Sundays) for from twenty to twenty-four days. The diet and medication were those on which the patients had previously been placed, in our clinic, elsewhere or by themselves. In most instances they were found to be on a high calory, low residual diet with little or no medication. It was deemed advisable to make no changes, as far as possible, in their diet or medication while they were under observation. Six of these patients were first given 5 cc. of physiologic solution of sodium chloride for six days and then switched to histidine injections without their knowledge of the change.

Results.—The immediate and sustained effect of histidine on this group can best be demonstrated in table 1.

At the Completion of the Injection.—Thirteen of the forty-one cases showed a decreased gastric acidity, twenty showed an increased gastric acidity, and one showed no change in gastric acidity. For one reason or another, this procedure could not be carried out on seven of the forty-one patients. Twenty-six of the patients gained weight, five lost weight and ten showed no change. The gain in weight was in most instances in direct ratio to the relief of symptoms and the increased caloric intake.

The relief of symptoms, when it occurred, usually appeared early in the treatment, at about the fifth to the seventh injection. It was not uncommon for the patient to experience a moderate increase of gastric distress after the injections had been started and just before obtaining relief from symptoms. No other local or systemic reaction was noted. Three of the six

17. Mitchell, H. H., and Hamilton, T. S.: The Biochemistry of the Amino Acids, New York, Chemical Catalog Company, 1929.

18. Twenty-eight patients were treated with "Larostidin" (Hoffmann-LaRoche) and thirteen with a 4 per cent aqueous isotonic solution of histidine hydrochloride prepared especially for this investigation. There was no apparent difference in response to these two preparations.

V 106 1936

patients receiving saline injections became symptom free before the histidine was started.

In thirty-three of the forty-one cases there was radiologic evidence of a crater before treatment; in twenty-two, the evidence persisted after treatment. In one case a crater was demonstrated after treatment when it had not been demonstrated before. Fourteen were symptom free and showed radiologic evidence of healed ulcer. Twelve were symptom free and showed radiologically that the ulcer was not healed. Eleven had persistent symptoms and gave radiologic evidence of healed ulcer. Four of these eleven patients have since been operated on, one for a marginal ulcer, one for a medium sized gastric ulcer, and two for duodenal ulcer; of the latter, one patient had persistent pain and one repeated hemorrhages. Two patients have refused operation that was advised because of the radiologic and clinical evidence. The five remaining patients showed nothing unusual in the radiologic or physical examination. However, two of them have been unable to solve their matrimonial difficulties, another is a young ambitious actor who has been unemployed for two years and has had recurring attacks of pain; a fourth, a man aged 56, who before 1929 had an excellent income, now finds himself unable to make adjustments to a meager wage, and the last, a young man, an electrician, unemployed for one and a half years, lost a 6 year old daughter with septicemia in 1932 and a second, aged 4 years, following an acute mastoiditis in 1934.

TABLE 2.—*Immediate and Late Effect from the Diet-Alkali Ambulatory Regimen in Peptic Ulcer: Forty Cases*

	Symptom Free	Crater Before Treatment	Persistent or Recurring Symptoms
Immediate results (at end of 4 weeks)	31	35	9
Late results, from 10 to 12 months..	16	..	24
Patients operated on.....	..	..	3

Follow Up.—The period of time that has elapsed since the completion of the injections varies from six months to one year. Thirty-two patients have been under observation over ten months. Of the thirty patients rendered symptom free by this regimen, there are at this time thirteen still symptom free. Twenty-six patients have had one or more relapses, and two patients have been lost.

It is interesting to note in which group the largest number of relapses occurred. Of the twelve cases presenting a persistent crater but symptom free, only three have remained asymptomatic, whereas of the fourteen cases rendered symptom free and in which no crater could be demonstrated after treatment, ten have remained asymptomatic.

CONTROL SERIES: DIET ALKALI REGIMEN

There were forty patients in the control series, thirty-six men and four women. Thirty-seven had duodenal ulcers and three gastric ulcers. A crater was demonstrated in thirty-five of the forty cases. The ages of this group ranged from 19 to 64, averaging 39 years. They received the alkali therapy and ambulatory diet of five feedings a day which is routine in our outpatient clinic as well as in many clinics elsewhere.

Results.—At the end of the first month of treatment or period corresponding to the completion of the histidine treated group, thirty-one of these patients were symptom free. Three of the remaining patients have since been operated on. The time that has elapsed since these patients were placed on a five feeding alkaline, ambulatory regimen varies from ten months to one year. Up to the present time, sixteen have remained symptom free, whereas twenty-four have had one or more relapses.

COMMENT

The apparent high response to a regimen that permits a patient with acute peptic ulcer to follow a liberal diet and remain at work appears very promising indeed. But, on further observation of these patients, not only does hope vanish but one can see the fallacies on which some of these preliminary deductions were based.

The work of Mann and Williamson has been confirmed and is now well recognized. It has contributed toward the understanding of the production and healing of a type of chronic ulcer. These observers believe that chronic ulcers in dogs are identical with chronic peptic ulcer in man. They point out that the production of chronic ulcers in dogs is the result of two significant factors, the chemical and the mechanical. Further, they demonstrate that these ulcers will heal readily if protected from the gastric contents.

Since the experimental work of Weiss and Aron, on which histidine therapy is based, was carried out on the Mann-Williamson animal, it would appear that their observations were correct but were insufficient to support their conclusions. It is not clear that an amino acid deficiency existed in their animals, nor can one be sure that ulcers ever existed or were prevented in the three animals studied.

It must also be admitted that the normal physiology of the animal was pretty well deranged by the Mann-Williamson operation. Not only does derangement prevent the alkaline duodenal secretions from protecting, by neutralization, the tissue adjacent to the stomach, but in this instance the adjacent tissue (jejunal) is unaccustomed to receiving such secretion. When the jejunum of these dogs is exposed, without the protection of a normal cellular amino acid content, to a continuous outpouring of acid chyme, it is hardly to be expected that ulcer will not develop. Nor could one expect to empower these cells with a function never intended by supplying this supposedly deficient element.

It has been shown by Matthews and Dragstedt [19] that the more unaccustomed a tissue is to receiving the gastric secretion, the higher is the incidence of ulcer. These workers produced experimentally a counterpart of the ulcer of Meckel's diverticulum in man by implanting a small isolated pouch of gastric tissue in the small intestine of animals at different distances from the duodenum. When the gastric tissue was implanted in the jejunum, ulcer resulted just distally to the implant in 85 per cent of the instances, but when it was implanted in the ileum, ulcers resulted in 100 per cent of the instances. Had Weiss and Aron supported their observations by a series of experiments using this technic and proved that ulcers thus produced could be healed or prevented by supplying the deficient amino acid in question, it would have been a more convincing piece of evidence.

Fontès and Bauer confirmed the work of Weiss and Aron but gave histidine by mouth instead of intramuscularly. This would suggest that histidine as such is absorbed readily from the intestinal tract. Certainly it is abundant in the diet of man, since it is a normal derivative of protein metabolism. What set of circum-

19. Matthews, W. B., and Dragstedt, L. R.: The Etiology of Gastric and Duodenal Ulcer, Surg., Gynec. & Obst. 55:265 (Sept.) 1932.

stances would lead to a deficiency of this substance would be difficult to understand. It is my impression that a careful survey would show that the ulcer patient receives a diet better both in quality and in quantity than the average American adult, granting, in advance, that his habits of taking food are usually faulty.

Another explanation of the action of histidine would seem to fit the facts more closely. Evidence is available in the literature to support the contention that the eroded area of an ulcer may need but little protection not only to relieve the acute symptoms but also to promote healing. Gastric mucin has been employed with some justification as a therapeutic agent in this connection. It probably exerts a protective effect on the membranes with which it comes in contact by virtue of its viscous nature and perhaps because of its buffer action, and recent reports [20] indicate that a symptomatic relief is obtained in from 63 to 93 per cent of the cases studied. The palliative effects of histidine in the treatment of hay fever have been reported by Lenormand.[21] He observed an increased flow of nasal mucus following its injection. The hypersensitive membranes, he states, are protected from the pollens. It is conceivable that the gastric mucus in a patient with a peptic ulcer might be stimulated in a similar way, thus giving relief of gastric symptoms similar to that obtained from gastric mucin. The work of Manginelli [22] tends to support this contention. He observed a better "analgesic effect" in acute ulcer pain when the histidine was given just before food was taken.

The many strange and unexplained conditions under which the acute symptoms of ulcer may subside are common experience. Fractional analysis made at the time of acute symptoms may show the gastric acidity to be high or low. Following the taking of a little food or soda, which usually gives immediate relief, the gastric acidity might be slightly lowered and then rise to a higher level than before. The relief from pain that follows gastro-enterostomy or the free bleeding from an ulcer is not easily explained. Remissions of symptoms sometimes occur in the absence of treatment or from a placebo of saline solution, as was demonstrated in this work in a few instances. A patient on a vacation may, and frequently does, become asymptomatic. The discouraging feature is that the symptoms usually recur similarly in the same strange manner. These facts are pointed out to make clear that the relief of symptoms is not a specific action of histidine, and the subsidence of symptoms alone cannot be taken as a criterion that the ulcer is healed.

Subsidence of acute symptoms following a strict Sippy regimen is so common that it is frequently regarded as a diagnostic test of ulcer. A recent report by Emery and Monroe [23] based on experience in 1,435 cases stated that their results were satisfactory with the "complete Sippy regimen" in 90 per cent of the cases, with the "partial Sippy" in 87 per cent, and with the "five feedings plus alkali schedule" in 82 per cent. These observers drew the conclusion "that none of the present methods of treatment do more than assist in the induction of remission, no matter how strict the medical schedule or how radical the operation."

The results in our histidine series are not quite as good as those in the control series on the less drastic ambulatory, diet-alkali regimen: 73.2 per cent and 78.4 per cent, respectively, showed symptomatic relief. The time consumed and the expense to the patient are much greater with histidine treatment than with the diet-alkali therapy. The frequency of relapses in both series suggests that histidine therapy in peptic ulcer is but another means of inducing a remission. In its favor it may be said that histidine appears to be harmless in the quantity administered, although Newburgh and Marsh [24] have shown that under certain conditions it may have a toxic effect on the kidney.

SUMMARY AND CONCLUSIONS

A series of forty-one selected patients with acute symptoms and radiologic signs of active peptic ulcer were treated with intramuscular injections of histidine hydrochloride (from twenty to twenty-four injections each). A crater was demonstrated radiographically in thirty of the forty-one patients. The previous diets of the patients were not changed and all but three of them were kept ambulatory. The immediate response to this therapy was fairly uniform and prompt. Thirty of the patients were relieved of their symptoms at or before the conclusion of the treatment. Fourteen of this asymptomatic group showed radiologic evidence of a healed ulcer, whereas twelve showed a crater still present. Eleven showed no improvement symptomatically or radiographically.

The period of observation varied from six months to one year; thirty-two patients have been under observation for ten months. At the present time thirteen are still symptom free and twenty-six have had one or more relapses. Of the twelve rendered symptom free but in whom a crater persisted, only three have remained symptom free, whereas of the fourteen rendered symptom free and in whom no crater could be demonstrated after treatment, ten have remained asymptomatic.

A second or control group of forty selected patients with acute symptoms and radiologic signs of active peptic ulcer (a crater was demonstrated radiologically in thirty-five) were treated with the usual ambulatory, diet-alkali ulcer regimen. At the end of the first four weeks of treatment, or period corresponding to the completion of treatment in the histidine group, thirty-one were symptom free. The period of observations varied from ten months to one year. At the present time sixteen have remained symptom free, whereas twenty-four have had one or more relapses. These figures correspond fairly closely to those in the literature.

The symptomatic and radiologic response of the patients in the histidine series was not quite as good as that in the diet-alkali regimen series, in either the initial or the sustained effects.

Symptomatic relief with a persistent crater is almost equally common to the two groups, as is a relapse of symptoms. The incidence of relapse is highest in the group rendered asymptomatic but with persistent crater.

Demonstration of a crater establishes a criterion by which a therapeutic substance may be tested, and it also affords a prognostic sign following any form of ulcer therapy.

The clinical improvement succeeding histidine hydrochloride therapy in acute peptic ulcer appears to be symptomatic and transient.

20. Fogelson, S. J.: Gastric Mucin Treatment for Peptic Ulcer: A Report Based on Questionnaires, Arch. Int. Med. 55:7 (Jan.) 1935. Gastric Mucin, Preliminary Report of the Council on Pharmacy and Chemistry, J. A. M. A. 102:767 (March 10) 1934.

21. Lenormand, J.: Amino-Acids in Treatment of Hay Fever, Presse méd. 41:1137 (July 19) 1933.

22. Manginelli, L.: Histidine in Gastric Therapeutics, Arch. d. mal. de l'app. digestif 25:460 (May) 1935.

23. Emery, E. S., and Monroe, R. T.: Peptic Ulcer: Nature and Treatment, Based on a Study of 1,435 Cases, Arch. Int. Med. 55:271 (Feb.) 1935.

24. Newburgh and Marsh, cited by Mitchell and Hamilton.[17]

V 106
1936

Chronicity and rhythmicity is a characteristic feature of peptic ulcer. Histidine appears to have no effect other than to alter the rhythm slightly.

Histidine hydrochloride showed no constant effect on the hydrochloric acid secretion in our series.

Histidine hydrochloride in the quantity used appears to be harmless.

The therapeutic indications for histidine in the treatment of peptic ulcer are necessarily limited. The extravagant claims that have been made for this substance are unwarranted.

115 East Sixty-First Street.

REPORTS OF THE COUNCIL

THE COUNCIL HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT.

PAUL NICHOLAS LEECH, Secretary.

LAROSTIDIN 'ROCHE' NOT ACCEPTABLE FOR N. N. R.

In the latter part of 1934 and in 1935 the medical profession was deluged with propaganda for "Unquestionably the most notable advance in the medical treatment of Gastric and Duodenal Ulcer," Larostidin "Roche." According to the advertising, this is a 4 per cent solution of *laevo*-histidine-monohydrochloride in an isotonic medium.

Hoffmann-La Roche, Inc., advanced such claims as:

"After approximately 24 injections, radiologic findings become negative and the patient may be discharged from treatment."

"An injection treatment which means:
no surgical intervention
no hospitalization,
except possibly in hemorrhage cases
no unusual, rigid dietary regimen
no interference with everyday routine
prompt relief of symptoms"

"Larostidin 'Roche' affords the physician a new means of combating peptic ulcer—a treatment which, for speed and effectiveness, surpasses the usual palliative measures."

These claims are selected at random from the large volume of advertising that has accumulated in the Council office.

Although there were some favorable reports, with which some of the claims were consonant, the Council questioned them and initiated a series of experiments to determine the usefulness of histidine hydrochloride and Larostidin 'Roche' in treating gastric and duodenal ulcer as compared with the diet-alkali regimen. The results of this investigation are reported in this issue of THE JOURNAL (Martin, K. A.: "Histidine versus Diet and Alkalis in Treatment of Peptic Ulcer," p. 1468). Of the forty-one patients who were the subject of Martin's report as treated by the injection method, twenty-eight were given Larostidin and the remaining thirteen received a specially prepared solution of histidine monohydrochloride and sodium chloride comparable with the composition of Larostidin-Roche. No difference in response to these two preparations was noted by the investigator. Controls with diet-alkali series were also used. The investigator reported that the symptomatic and radiologic response of forty-one patients in the injection series was not quite so good as that of the forty control patients in the diet-alkali series, in either the initial or the sustained effects.

A careful reading of the results of the investigation indicates that many of the Hoffmann-La Roche claims for Larostidin are enthusiastic beyond the bounds of permissible optimism and are unsupported—and even contradicted—by this series of experiments. As a result of its consideration of the paper of Martin and others, however, the Council concluded that, although there is at present insufficient clinical evidence for its evaluation, histidine hydrochloride shows promise of possible usefulness in the treatment of gastric and duodenal ulcer. The Council sponsored publication of Dr. Martin's paper to serve in the manner of a preliminary report.

The Council declared Larostidin (Hoffman-La Roche, Inc.) not acceptable for New and Nonofficial Remedies, because it is marketed with unwarranted therapeutic claims, and voted to postpone further consideration of histidine monohydrochloride until adequate clinical evidence of its therapeutic usefulness is available.

Committee on Foods

ACCEPTED FOODS

THE FOLLOWING PRODUCTS HAVE BEEN ACCEPTED BY THE COMMITTEE ON FOODS OF THE AMERICAN MEDICAL ASSOCIATION FOLLOWING ANY NECESSARY CORRECTIONS OF THE LABELS AND ADVERTISING TO CONFORM TO THE RULES AND REGULATIONS. THESE PRODUCTS ARE APPROVED FOR ADVERTISING IN THE PUBLICATIONS OF THE AMERICAN MEDICAL ASSOCIATION, AND FOR GENERAL PROMULGATION TO THE PUBLIC. THEY WILL BE INCLUDED IN THE BOOK OF ACCEPTED FOODS TO BE PUBLISHED BY THE AMERICAN MEDICAL ASSOCIATION.

FRANKLIN C. BING, Secretary.

CELLU BRAND TIPS OF ASPARAGUS, WATER PACKED

Distributor.—Chicago Dietetic Supply House, Inc., Chicago.

Packer.—L. H. Schlecht, Rossville, Ill.

Description.—Canned green asparagus tips packed in water.

Manufacture.—Selected green asparagus tips are harvested at the proper degree of maturity, cut to standard lengths, sorted by hand for size, cleaned by spraying with water under pressure, blanched, cooled and hand packed in cans. The cans are filled with boiling water, sealed and processed.

Analysis (submitted by distributor).—

	per cent
Moisture	93.8
Total solids	6.2
Ash	0.9
Fat (ether extract)	0.1
Protein (N × 6.25)	1.7
Crude fiber	0.6
Starch (diastase method)	2.2
Carbohydrates other than crude fiber (by difference)	2.9

Calories.—0.2 per gram; 6 per ounce.

Claims of Manufacturer.—Choice quality green asparagus tips packed without added sugar or salt. For use in special diets in which sugar or salt is proscribed or in quantitative diets of calculated composition.

TRU-LI-PURE BRAND PASTEURIZED HOMOGENIZED MILK

Manufacturer.—Nashville Pure Milk Company, Nashville, Tenn.

Description.—Bottled, pasteurized, homogenized milk.

Manufacture.—Milk obtained from tuberculin tested cows under government and company inspection is regularly tested for bacteria, sediment, nonfat solids, acidity and temperature. Milk that passes the test is filtered, heated to 54 C., homogenized at 3,000 pounds pressure, pasteurized by the standard holding method (62-63 C. for thirty minutes), cooled, automatically filled into bottles and capped.

Analysis.—Standardized to contain not less than 4.1 per cent of milk-fat.

Claims of Manufacturer.—The cream does not separate. The curd formed in the stomach is softer and more readily digestible than that from unhomogenized milk.

CARNATION COOK BOOK

Sponsor.—Carnation Company, Milwaukee.

An extensively illustrated Cook Book prepared by the Home Economics Department of the Carnation Company and the Erwin, Wasey & Company advertising agency, Chicago. Contains brief introductory discussion of the composition, nutritive value, digestibility and use in cookery and in children's and infants' diets of Carnation milk. Special menus and recipes for use in diets of older children and invalids, menus for special occasions and recipes for typical national dishes are included.

HEINZ BRAND STRAINED APRICOTS AND APPLESAUCE

Manufacturer.—H. J. Heinz Company, Pittsburgh.

Description.—Canned mixture of strained apricots and apples retaining in high degree the natural vitamins and minerals.

Manufacture.—Selected fully ripened apricots are sorted, pitted, trimmed and steamed. Well ripened apples are mechanically peeled, hand trimmed, cut and steamed. In an atmosphere of steam, two parts of apricots and one part of apples by weight are mixed, comminuted, strained—sugar may be added to maintain uniform sweetness—vacuumized and filled into special enamel lined cans, which are sealed under vacuum and processed.

Analysis (submitted by manufacturer).—

	per cent
Moisture	82.8
Total solids	17.2
Ash	0.6
Fat (ether extract)	0.1
Protein (N × 6.25)	0.6
Reducing sugars as invert sugar	8.9
Total sugars as invert sugar	12.7
Crude fiber	0.7
Carbohydrates other than crude fiber (by difference)	14.4
Titratable acidity as citric acid	0.8
Calcium (Ca)	0.01
Phosphorus (P)	0.02
Iron (Fe)	0.0013
Copper (Cu)	0.0001

Calories.—0.6 per gram; 17 per ounce.

Vitamins.—Vitamin biologic assay shows 360 Sherman units (504 International units) of vitamin A per ounce; 6 Sherman units of vitamin B per ounce; 5 Sherman-Bourquin units of vitamin G per ounce.

Chemical assay shows 25 International units of vitamin C per ounce.

Claims of Manufacturer.—For table use, but especially intended for infants, children and convalescents.

ROBERTS BRAND UNSWEETENED EVAPORATED MILK

Manufacturer.—Roberts Dairy Company, Omaha.

Description.—Unsweetened, sterilized, evaporated milk.

Manufacture.—Milk from company inspected farms, tested daily for flavor, acidity, sediment and bacterial activity, is preheated, evaporated under vacuum, filtered, homogenized, cooled to 6 C., standardized to 7.8 per cent milk-fat and 26.2 per cent total milk solids, filled into cans, sealed and sterilized.

Analysis (submitted by manufacturer).—

	per cent
Moisture	73.8
Total solids	26.2
Ash	1.1
Fat (ether extract)	7.8
Protein (N × 6.38)	6.9
Lactose (by difference)	10.4

Calories.—1.4 per gram; 40 per ounce.

Claims of Manufacturer.—See announcement on the advertising of the Evaporated Milk Association (THE JOURNAL, Dec. 19, 1931, p. 1890).

ADVERTISING LEAFLET "SIMPLIFIED INFANT FEEDING"

(FOR PHYSICIANS ONLY)

Sponsor.—Carnation Company, Milwaukee.

Description.—Advertising leaflet prepared by Erwin, Wasey & Company, advertising agency, for the Carnation Company for distribution to physicians. Contains discussion of advantages of evaporated milk for infant feeding, methods of irradiation, chemical composition of irradiated Carnation milk, antirachitic potency of irradiated milk, effect of the processes of evaporation and irradiation on other vitamins of milk, chemical changes resulting from evaporation, and claims accepted by the Committee on Foods for irradiated evaporated milks. Specific directions for feeding irradiated Carnation milk to normal infants and to infants presenting special feeding problems are included. Future editions of the booklet will contain statements of vitamin D unitage and cod liver oil equivalence per fluidounce of irradiated Carnation milk.

ARIZ-SWEET BRAND GRAPEFRUIT JUICE

Manufacturer.—Ariz-Sweet Grapefruit Growers, Ltd., Peoria, Ariz.

Description.—Canned Arizona grapefruit juice, retaining in high degree the original vitamin C content.

Manufacture.—Tree-ripened fruit, picked at a definite stage of maturity, under laboratory control, is cleaned, sorted, thoroughly washed, again sorted, and automatically halved. The juice, extracted by light manual pressure on grapefruit halves in contact with revolving burrs, is strained, heated to 32 C., deaerated under vacuum, flash pasteurized, filled into cans and vacuum sealed.

Analysis (submitted by manufacturer).—

	per cent
Moisture	89.3
Total solids	10.7
Ash	0.5
Fat (ether extract)	0.1
Protein (N × 6.25)	0.5
Crude fiber	0.1
Reducing sugars as invert sugar	6.3
Sucrose	1.0
Carbohydrates other than crude fiber (by difference)	9.5
Acidity as citric acid	1.3

Calories.—0.4 per gram; 11 per ounce.

Vitamins.—Chemical titration shows an average cevitamic acid (ascorbic acid) content of 0.4 mg. per cubic centimeter, 11.8 mg. per fluidounce, equivalent to approximately 17 Sherman La Mer units of vitamin C per fluidounce. The analysis shows practically no reduction of vitamin C in the canned product.

Claims of Manufacturer.—Intended for all dietary and table uses of grapefruit juices.

HORMEL BRAND CORNED BEEF HASH

Manufacturer.—Geo. A. Hormel & Company, Austin, Minn.

Description.—Canned corned beef hash; cooked potatoes, corned beef, and onion; seasoned with salt, sugar and pepper.

Manufacture.—Fresh chuck beef, United States inspected and passed by the Department of Agriculture, is trimmed of gristle and excess fat, cut in small pieces, seasoned with salt and sugar, mixed with saltpeter and nitrite to preserve the red color of the meat, and cured in salt brine. Saltpeter and nitrite are largely removed when the cured meat is later drained, covered with hot water and boiled for five minutes, again drained and ground. Partially cooked, diced potatoes (mechanically peeled and hand eyed) and peeled, washed and ground white onions are added in formula proportions. The mixture is heated, automatically packed in cans, sealed and heat processed.

Analysis (submitted by manufacturer).—

	per cent
Moisture	68.3
Total solids	31.7
Ash	2.1
Fat (ether extract)	10.6
Protein (N × 6.25)	10.1
Crude fiber	0.1
Carbohydrates other than crude fiber (by difference)	8.8

Calories.—1.7 per gram; 48 per ounce.

CELLU BRAND GREEN STRINGLESS BEANS, WATER PACKED

Distributor.—Chicago Dietetic Supply House, Inc., Chicago.

Packer.—Eugene Fruit Growers Association, Eugene, Ore.

Description.—Canned green stringless beans, packed in water.

Manufacture.—Selected green stringless beans, harvested at the proper degree of maturity, are mechanically snipped, inspected, graded for size, blanched and filled into cans by hand. The cans are filled with water, heated, sealed and processed.

Analysis (submitted by distributor).—

	per cent
Moisture	93.0
Total solids	5.0
Ash	0.8
Fat (ether extract)	0.1
Protein (N × 6.25)	1.0
Crude fiber	0.5
Starch (diastase method)	1.9
Carbohydrates other than crude fiber (by difference)	2.6

Calories.—0.2 per gram; 6 per ounce.

Claims of Manufacturer.—Choice quality green stringless beans packed in water without added sugar or salt. For use in special diets in which sugar or salt is proscribed or in quantitative diets of calculated composition.

V 106 1936

MEDICAL LICENSURE STATISTICS FOR 1935

ANNUAL PRESENTATION OF LICENSURE STATISTICS BY THE COUNCIL ON MEDICAL EDUCATION AND HOSPITALS OF THE AMERICAN MEDICAL ASSOCIATION

The report presented herewith for the year 1935 deals with statistics regarding (*a*) medical licensing boards of the United States, including the District of Columbia and territories and possessions of the United States, (*b*) boards of examiners in the basic sciences, and (*c*) the National Board of Medical Examiners. Official reports have been contributed by the officers of the medical licensing boards of all states, the District of Columbia, Alaska, the Canal Zone, Hawaii, Puerto Rico and the Virgin Islands; the homeopathic examining boards of Arkansas, Connecticut, Delaware, Louisiana and Maryland; the eclectic board in Arkansas; the ten basic science boards (Arizona, Arkansas, Connecticut, District of Columbia, Iowa, Minnesota, Nebraska, Oregon, Washington and Wisconsin), and the National Board of Medical Examiners. The homeopathic boards of Arkansas and Louisiana and the eclectic board in Arkansas did not license any one during the year. Acknowledgment is tendered the officers of the foregoing boards for their ready cooperation and the complete reports they have furnished.

The data supplied were also entered in the biographic file of physicians and others maintained by the American Medical Association, thus serving a dual purpose. Many state licensing boards get in touch with the American Medical Association for verification of biographic data and other claims before granting a license or permission to take the licensing examination. This service is available to all licensing boards.

The tables showing medical licensing board results include figures regarding the number of candidates for medical licensure in 1935, the number licensed and the number added to the profession.

LICENTIATES

The first table shown contains figures on the number of licenses issued in the various states, territories and possessions during the year. There were 7,887 licenses issued, 5,707 on the basis of examination and 2,180 by endorsement of credentials. In several states (table 7) the internship is a requisite for practice, but a physician is permitted to take the examination and if successful his license is withheld until completion of his internship. Licenses are also withheld for lack of citizenship or minor technicalities. The figures, therefore, for those licensed after examination include many who were examined in 1934 and even a few in previous years. New York issued the largest number of licenses, 1,274; Illinois and Pennsylvania each issued 525, California 472, Ohio 416, Texas 319 and New Jersey 318. A comparison with similar figures for 1934 indicates that New York issued sixteen fewer licenses and New Jersey fourteen fewer in 1935, while Illinois licensed 67 more and Pennsylvania 5, California 54, Ohio 19 and Texas 48 more.

Four states issued between 200 and 300 licenses and fourteen between 100 and 200. Twenty-four states, Alaska, Hawaii, Puerto Rico and the Virgin Islands licensed less than 100. Only one was licensed by examination in New Mexico. Florida grants licenses only on the basis of examination. Massachusetts and Rhode Island have no reciprocity privileges but endorse diplomates of the National Board of Medical Examiners. The total number licensed, 7,887, was 157 more than in 1934. This figure, however, does not represent 7,887 individuals, since several have been licensed in more than one state during the year. Nor does it represent additions to the medical profession at large, since the 2,180 licensed by endorsement, with the exception of those licensed in New York on the basis of foreign credentials, have migrated from other states. Table 5 shows how many of those licensed were never before registered and therefore represent the number added to the medical profession.

TABLE 1.—*Licentiates—1935*

	Licensed on Basis of		
	Examination	Reciprocity and Endorsement	Total
Alabama	57	26	83
Arizona	8	17	25
Arkansas	42	19	61
California	329	143	472
Colorado	59	34	93
Connecticut	59	44	103
Delaware	13	3	16
District of Columbia	43	37	80
Florida	135	0	135
Georgia	98	16	104
Idaho	8	13	21
Illinois	424	101	525
Indiana	105	44	149
Iowa	97	39	136
Kansas	94	34	128
Kentucky	72	38	110
Louisiana	112	6	118
Maine	45	16	61
Maryland	144	30	174
Massachusetts	195	68	263
Michigan	227	57	284
Minnesota	173	14	187
Mississippi	31	17	48
Missouri	196	51	247
Montana	8*	18	26
Nebraska	90	12	102
Nevada	3	15	18
New Hampshire	4	34	38
New Jersey	182	136	318
New Mexico	1	28	29
New York	870	404	1,274
North Carolina	64	48	112
North Dakota	14	9	23
Ohio	284	132	416
Oklahoma	59	28	87
Oregon	55	11	66
Pennsylvania	464	61	525
Rhode Island	50	1	51
South Carolina	49	7	56
South Dakota	20	10	30
Tennessee	178	24	202
Texas	188	131	319
Utah	20	13	33
Vermont	19	18	37
Virginia	105	48	153
Washington	42	42	84
West Virginia	38	42	80
Wisconsin	109	21	130
Wyoming	3	14	17
U. S. Terr. and Possessions*	43	15	58
Totals	5,707	2,180	7,887

* Alaska, Hawaii, Puerto Rico, Virgin Islands.

TOTAL EXAMINED

In table 2 are included figures referring to those examined for medical licensure by individual states throughout the year, giving the number who passed and failed in each state. There were 6,426 examined, of whom 5,841 passed and 585 failed, representing graduates from sixty-seven approved medical schools in the United States and nine in Canada, seventy-seven medical schools of other countries, twenty medical schools now extinct, nine unapproved institutions and

(CONTINUED ON PAGE 1478)

Marginal Number	SCHOOL	1 Alabama P	F	2 Arizona P	F	3 Arkansas P	F	4 California P	F	5 Colorado P	F	6 Connecticut P	F	7 Delaware P	F	8 Dist. Columbia P	F	9 Florida P	F	10 Georgia P	F	11 Idaho P	F	12 Illinois P	F	13 Indiana P	F	14 Iowa P	F	15 Kansas P	F	16 Kentucky P	F	17 Louisiana P	F	18 Maine P	F	19 Maryland P	F	20 Massachusetts P	F	21 Michigan P	F	22 Minnesota P	F	Marginal Number
	ARKANSAS																																											
1	University of Arkansas School of Medicine					28	0	1	0									1	0																									1
	CALIFORNIA																																											
2	College of Medical Evangelists			1	1			47	0													1	0													1	0			1	0	2	0	1	0	2
3	Stanford University School of Medicine							44	0																											1	0			2	0			3
4	University of California Medical School							46	1																											1	0							4
5	University of Southern California Sch. of Med.			0	1			33	0																																			5
	COLORADO																																										
6	University of Colorado School of Medicine	2	0			3	0	37	0									1	0			1	0	1	0			2	0			1	0							1	0	2	0	6
	CONNECTICUT																																										
7	Yale University School of Medicine					1	0			3	0							2	0					0	1											1	0					1	0	7
	DISTRICT OF COLUMBIA																																										
8	George Washington University School of Med.	1	0	2	0			5	0			1	1	1	0	16	0	1	0					1	0							1	0					10	0	0	0	1	1	0	1	8
9	Georgetown University School of Medicine											3	1			10	1	1	0																	1	0	14	0	5	3	1	0	2	0	9
10	Howard University College of Medicine															2	0	1	2																									10
	GEORGIA																																											
11	Emory University School of Medicine							1	0									14	1	69	0															1	0					1	0	11
12	University of Georgia School of Medicine													0	1			6	2	23	0																							12
	ILLINOIS																																										
13	Loyola University School of Medicine					3	0																	44	1	3	1	0	0	0										4	0	1	0	13
14	Northwestern University Medical School	2	0			14	1	3	0	1	0							3	0			1	0	22	1	3	0	2	0	4	0	1	0	1	0			1	0	3	0	2	0	14
15	University of Chicago, Rush Medical College	3	0			16	1			1	0	1	0					4	1					45	1	1	0	1	0	3	0					1	0	5	0	3	0	5	0	15
16	University of Chicago, The School of Medicine of the Division of the Biological Sciences			2	0			2	0															17	0																	6	0			16
17	University of Illinois College of Medicine							15	0									3	1					125	0			1	0											0	1	2	0	3	0	17
	INDIANA																																											
18	Indiana University School of Medicine					3	0											1	0							66	1							1	0							1	0	18
	IOWA																																											
19	State University of Iowa College of Medicine					3	0															1	0			1	0	65	1									1	0			2	0	19
	KANSAS																																											
20	University of Kansas School of Medicine																	1	0							68	0			1	0											2	0	20
	KENTUCKY																																											
21	University of Louisville School of Medicine					2	0			1	1							2	0							1	0	1	0			69	0									2	0	21
	LOUISIANA																																											
22	Louisiana State University Medical Center	1	0															3	0	1	0											49	0											22
23	Tulane University of Louisiana School of Med.	21	0			2	0	4	0									18	1	1	0											71	0					1	0			2	0	23
	MARYLAND																																											
24	Johns Hopkins University School of Medicine	1	0					1	0									4	0	5	0			1	0													1	0	38	1	3	0	2	0	24
25	University of Maryland School of Medicine and College of Physicians and Surgeons							4	0	1	0	1	0	1	1	1	0							1	0													62	1	1	1			1	0	25
	MASSACHUSETTS																																											
26	Boston University School of Medicine							1	0			5	0																							2	0			32	10	1	0			26
27	Harvard University Medical School	1	0					3	0			1	0			1	0	3	0					1	0							1	0	1	0	6	0	1	0	68	2	0	3	0	27
28	Tufts College Medical School							1	0			11	2					2	1																	14	0			45	14					28
	MICHIGAN																																											
29	University of Michigan Medical School					2	0	1	0	2	0							1	0			1	0																	4	0	32	0	2	0	29
30	Wayne University College of Medicine					1	1											1	0																					78	0	7	0	30
	MINNESOTA																																											
31	University of Minnesota Medical School					4	0											2	0			0	1	2	0	1	0	1	0									1	0	5	0	32	0	1	31
	MISSOURI																																											
32	St. Louis University School of Medicine					1	0											1	1					1	0													0	2	1	0	1	0	32
33	Washington University School of Medicine					5	0	1	0	2	0							1	0					1	0									1	0			7	0			2	0	33
	NEBRASKA																																											
34	Creighton University School of Medicine					3	0											1	0					3	1	1	0	2	0	1	0									1	0	1	0	34
35	University of Nebraska College of Medicine					1	0			1	0													1	0			1	0	4	0			2	0			1	0			1	0	4	0	35
	NEW YORK																																											
36	Albany Medical College																																											36
37	Columbia University Coll. of Phys. and Surgs.									5	0	1	0					1	0	1	0															2	0	1	0	6	1					37
38	Cornell University Medical College									1	0							2	0																	1	0			2	1			1	0	38
39	Long Island College of Medicine									2	0							1	0																			1	0	1	0					39
40	New York Homeo. Med. Coll. and Flower Hosp.																											1	0											1	0	1	0			40
41	New York University College of Medicine	1	0																							1	0											1	0							41
42	Syracuse University College of Medicine									1	0							1	0																	1	0	1	0							42
43	University of Buffalo School of Medicine																																									3	0			43
44	University of Rochester School of Medicine									1	0															1	0											2	0	1	0	1	0			44
	NORTH CAROLINA																																											
45	Duke University School of Medicine	1	0													1	0	2	0																	2	0					1	0	45
	OHIO																																											
46	Ohio State University College of Medicine																	1	0																									46
47	University of Cincinnati College of Medicine																	3	0													1	0	1	0			1	0			1	0	47
48	Western Reserve University School of Medicine																	1	0																									48
	OKLAHOMA																																											
49	University of Oklahoma School of Medicine	1	0					1	1									1	0											1	0													49
	OREGON																																											
50	University of Oregon Medical School			1	0			8	0									1	0											1	0							1	0	1	0	2	0	50
	PENNSYLVANIA																																											
51	Hahnemann Medical College and Hosp. of Phila.							2	0			4	0	0	2																					2	0	0	2	3	0					51
52	Jefferson Medical College of Philadelphia							2	0	1	0	1	1	1	0			2	0									2	0			1	0					2	0			3	0			2	0	52
53	Temple University School of Medicine							1	0					0	1	1	0	3	1																											53
54	University of Pennsylvania School of Medicine	1	0					2	0			1	0	1	0			3	0			1	0	2	0	1	0			2	0	1	0							1	0	2	1	3	0	0	0	54
55	University of Pittsburgh School of Medicine																	1	0																											55
56	Woman's Medical College of Pennsylvania							1	0			0	1					1	0																							1	0			56
	SOUTH CAROLINA																																											
57	Medical College of the State of South Carolina																	2	0					1	0																					57
	TENNESSEE																																											
58	Meharry Medical College							0	1									0	1	0	2									1	0			4	0			2	0							58
59	University of Tennessee College of Medicine					2	0											7	1	1	0											2	0	5	0					1	0					59
60	Vanderbilt University School of Medicine	3	0					1	0									1	0	4	1													1	0					1	0	1	0	1	0	60
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22																					

P = Passed; F = Failed.

V 106
1936

Hospital Number	Mississippi	Missouri	Montana	Nebraska	Nevada	New Hampshire	New Jersey	New Mexico	New York	North Carolina	North Dakota	Ohio	Oklahoma	Oregon	Pennsylvania	Rhode Island	South Carolina	South Dakota	Tennessee	Texas	Utah	Vermont	Virginia	Washington	West Virginia	Wisconsin	Wyoming	U. S. Territories and Possessions*	Totals	Examined—Passed	Examined—Failed	Percentage Failed	No. Boards Examined by Hospital Number
	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F					
1									4 1																				45	44	1	2.2	4 1
2							1 0		1 0					3 0					1 0 2 0					1 0			1 0	46	45	1	1.5	34 2
3																												1 0	69	69	0	0.0	4 3
4							2 0		0 1																				24	23	1	4.2	4 4
5																													34	33	1	2.9	4 5
6		2 0							1 0																		1 0		35	35	0	0.0	14 6
7							1 0		2 0						1 0														13	12	1	7.7	9 7
8		1 0							13 0			1 0		5 0									1 0						73	70	3	4.2	19 8
9							4 0		9 0			2 0		24 2	1								1 0	1 0				2 0	139	107	32	17.7	16 9
10	7 1						2 0		6 1	3 0				4 0	1 0				3 0				2 0			1 0		1 0	85	80	5	5.1	20 10
11	5 0								2 1	2 0				2 0													1 0	62	60	2	3.4	11 11
12									2 0					1 0			1 0											46	46	0	0.0	6 12
13	3 0	1 0					5 0		9 7			10 0		1 0	1 0	2 0									2 0		2 2	188	88	11	10.7	17 13
14	7 0	2 0				1 0	1 0		9 2	3 0	3 0	1 0		1 0	1 0					2 0	1 0				7 0	1 0	1 0	162	150	4	2.5	20 14
15	5 1					1 0	4 0		5 1			5 0					1 0	1 0	2 0					2 0	3 0	1 0	2 0	160	155	5	3.1	20 15
16	1 0						1 0		2 0			1 0											1 0		1 0			34	34	0	0.0	10 16
17	5 0						0 1		3 0				1 0					2 0										165	160	5	3.0	15 17
18												1 0		1 0													1 0 2 0	108	107	1	0.9	9 18
19	1 0											1 0																76	75	1	1.3	8 19
20	2 0						1 0					1 0 1 0		1 0													1 0 1 0	89	89	0	0.0	11 20
21							1 0		2 0			1 0			1 0								1 0				5 0 2 0	1 0	96	95	1	1.1	15 21
22	1 0								2 0					2 0	2 0				2 0 1 0 1 0 1 0									1 0	68	68	0	0.0	5 22
23	15 0 1 0 1 0								2 0																			1 0	151	150	1	0.7	20 23
24									4 0 1 0			1 0			2 0											1 0		88	87	1	1.2	14 24
25							6 0		10 1 7 0			1 0			7 0 1 0								1 0		1 0			111	107	4	3.6	17 25
26						1 0	5 0		11 3			2 0			1 0 2 0													73	67	15	20.5	10 26
27									7 0 1 0			2 0			3 0 2 0 1 0				4 0 3 0 2 0 1 0				1 0		4 0			89	87	2	2.2	20 27
28						3 0	1 0		5 1						11 1										2 0 1 0		1 0	117	98	19	16.2	13 28
29	1 0						1 0		9 2						2 0 1 0								1 0		1 0		1 0	135	132	3	2.2	15 29
30									2 0						1 0													97	96	1	1.0	6 30
31	1 0 1 0						2 0		2 1			2 0	2 0 1 0						3 0						6 0		1 0	131	129	2	1.5	19 31
32	78 0						4 0		9 3			2 0			11 1 3 0					1 0		1 0			1 0	1 0	124	117	7	5.7	10 32
33	84 3 1 0								10 1			2 0 1 0							1 0							2 0	119	115	4	3.4	15 33
34	1 0		27 0						0 1			2 0 1 0 1 0							2 0			1 0			4 0			71	69	2	2.8	17 34
35	1 0		65 0				2 0		1 0			1 0	1 0 1 0						2 0			1 0			2 0	1 0 1 0 2 0		97	97	0	0.0	23 35
36									14 0																			14	14	0	0.0	1 36
37							4 0		75 2						1 0													108	106	2	1.9	10 37
38							1 0		24 4 2 0			2 0		1 0									1 0	1 0				44	39	5	11.4	12 38
39							6 0		19 1 0					1 0							1 0				1 0			114	105	9	7.9	19 39
40							1 0		22 17			2 0			1 0													77	60	17	22.1	7 40
41							3 0		113 4 1 0															2 0				126	122	4	3.2	7 41
42									29 1 2 0						1 0													47	46	1	2.1	7 42
43									17 1			1 0			1 0													60	59	1	1.6	8 43
44							2 0		19 2			1 0		1 0 2 0														48	44	2	4.4	11 44
45							2 0			1 0									1 0 1 0				1 0					17	17	0	0.0	10 45
46												26 0			2 0													59	59	0	0.0	3 46
47												23 1												1 0 1 0			1 0	72	70	2	2.8	8 47
48												22 1			1 0 2 0												1 0	72	71	1	1.4	5 48
49		2 0							1 0				21 0		1 0													61	60	1	1.6	5 49
50									1 0		1 0			42 0					1 0 2 0				10 0		1 0		1 0	75	75	0	0.0	15 50
51							10 0		5 3			5 0			24 1 4 1												1 1	132	124	8	6.1	12 51
52							14 0		14 2 1 0			3 0			22 0 1 0				1 0						1 0		0 1	126	120	7	5.5	10 52
53							10 0		7 1 4 0						20 0 1 0				1 0								1 0	114	111	3	2.6	13 53
54							9 0		11 3 0 1 0	1 0	1 0	1 0			18 0 1 0					2 0 1 0			1 0	1 0 1 0	1 0		2 0	140	134	6	4.3	20 54
55									3 0						10 0 1 0				1 0									97	93	4	4.0	3 55
56		1 0							1 4			1 0			10 0 1 0												1 0	97	92	5	12.5	10 56
57									2 1 1 0									20 0										47	46	1	2.1	5 57
58	1 0 1 0									2 0									1 0			24 0						51	47	4	7.8	11 58
59	5 0								1 0										21 1			20 0				2 0		119	117	2	1.7	10 59
60	3 0						1 0								2 0			2 0	20 0								1 0	89	88	1	1.1	14 60

P = Passed; F = Failed.

* Alaska, Hawaii, Puerto Rico

Marginal Number	SCHOOL	1 Alabama P	F	2 Arizona P	F	3 Arkansas P	F	4 California P	F	5 Colorado P	F	6 Connecticut P	F	7 Delaware P	F	8 Dist. Columbia P	F	9 Florida P	F	10 Georgia P	F	11 Idaho P	F	12 Illinois P	F	13 Indiana P	F	14 Iowa P	F	15 Kansas P	F	16 Kentucky P	F	17 Louisiana P	F	18 Maine P	F	19 Maryland P	F	20 Massachusetts P	F	21 Michigan P	F	22 Minnesota P	F	Marginal Number
	TEXAS																																													
61	Baylor University College of Medicine							1	0																									3	0											61
62	University of Texas School of Medicine											2	1					1	0																							1	0			62
	VERMONT																																													
63	University of Vermont College of Medicine											1	1																									2	0			4	1	1	0	63
	VIRGINIA																																													
64	Medical College of Virginia							1	0					1	0	2	0	1	0													1	0									1	0	64
65	University of Virginia Department of Medicine													2	0	3	0	1	0																							1	0	65
	WISCONSIN																																													
66	Marquette University School of Medicine																													4	0											5	0	3	0	66
67	University of Wisconsin Medical School							1	0			1	0													2	0							1	0	2	0			1	0	1	0	67
	CANADA																																													
68	Dalhousie University Faculty of Medicine																																													68
69	Laval University Faculty of Medicine																																							0	2					69
70	McGill University Faculty of Medicine							4	0			1	0					1	1	1	0			1	0													4	0			5	0	3	0	70
71	Queen's University Faculty of Medicine							1	0			1	0																									2	0	1	0	1				71
72	University of Alberta Faculty of Medicine																					1	0																							72
73	University of Manitoba Faculty of Medicine																																									1	0	3	0	73
74	University of Montreal Faculty of Medicine																																							0	1					74
75	University of Toronto Faculty of Medicine							1	0									3	0					1	1															1	0					75
76	University of Western Ontario Medical School																																								1	0			1	0	76
77	Foreign Medical Faculties							24	7	3	0	5	1					3	0					9	1	2	1	1	0							1	1	16	16	7	11	5	2	2	0	77
78	Extinct Medical Schools							1	1									9	9																	1	0				1	0				78
79	Unapproved Schools and Undergraduates							1	0	13	1	0	2					1	0					67	3	1	0							1	0					31	185					79
80	Totals	37	10	42	342	60	76	18	44	159	90	8	433	119	78	94	81	134	46	222	436	245	173	80
81	Totals—Examined—Passed	37	8	42	328	59	63	13	43	135	88	7	422	115	77	94	81	134	45	194	197	241	173	81
82	Totals—Examined—Failed	0	2	0	14	1	13	5	1	24	2	1	10	4	1	0	0	0	1	28	239	2	0	82
83	Percentage Failed	0.0	20.0	0.0	4.1	1.7	17.1	27.8	2.3	15.1	2.2	12.5	2.3	3.4	1.3	0.0	0.0	0.0	2.2	12.6	54.8	0.8	0.0	83
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	

P = Passed; F = Failed.

(CONTINUED FROM PAGE 1475)

several osteopathic colleges. Four undergraduates also were examined. Osteopaths granted the privilege to practice medicine, surgery or both by the medical board are included in these statistics. There were 5,511 graduates of approved medical schools in the United States examined, of whom 4 per cent failed; 112 graduates of approved Canadian medical schools, 17.9 per cent of whom failed; 437 graduates of schools outside the United States and Canada with 30.9 per cent failures; twenty-six who graduated from schools now extinct with 46.2 per cent of failures, and 340 from unapproved and osteopathic schools, of whom 57.9 per cent failed. These 340 candidates represented seventy-nine graduates of osteopathic schools, of whom twenty-seven passed and fifty-two, 65.8 per cent, failed; 257 graduates of unapproved schools, of whom 114 passed and 143, 55.6 per cent, failed; four undergraduates were examined, two of whom passed, one each in Kentucky and Oklahoma and two failed, one each in Mississippi and New York. The undergraduates in Kentucky and Oklahoma were granted a license limiting practice to a remote district. Mississippi examined one candidate by a special act of the legislature. Graduates of osteopathic schools were examined in Colorado, Connecticut, Massachusetts, New Jersey and Texas, while graduates of unapproved schools were examined in California, Florida, Illinois, Indiana, Massachusetts, Missouri, Ohio, Rhode Island, South Dakota and Hawaii. Illinois registered sixty-seven, Massachusetts twenty-six and Ohio sixteen practitioners of the latter group.

The largest number of graduates of any one school was 163 from Northwestern University Medical School, who were examined in thirty-two states, and the University of Illinois College of Medicine, also 163, examined in twelve states. The next highest number of graduates from any one school was Rush Medical College, which had 160 graduates examined in twenty-six states. The New York Homeopathic Medical College and Flower Hospital and Boston University School of Medicine had the highest percentage of failures in the United States, 22.1 per cent and 20.8 per cent, respectively. Graduates of Northwestern University Medical School were examined in thirty-two, the University of Pennsylvania School of Medicine in twenty-nine, Rush Medical College in twenty-six and Harvard University Medical School in twenty-five states. From these statistics it might be inferred that these schools educate more nonresidents than do other schools. All the graduates of Albany Medical College, fourteen, were examined in New York. None failed. Graduates of the University of Southern California School of Medicine were examined in two states, and graduates of Ohio State University College of Medicine and the University of Pittsburgh School of Medicine in three states. The one eclectic board in existence, in Arkansas, did not examine any candidates. Canadian graduates took the test in twenty-four states. The greatest number, thirty-eight, represented McGill University Faculty of Medicine, who were examined in fourteen states; twenty-four graduates of the University of Toronto Faculty of Medicine were examined in twelve states, and eighteen graduates of Queen's University Faculty of Medicine were examined in eight states. Two graduates of the University of Montreal Faculty of Medicine were examined and failed. The next highest percentage of failures was 75, representing Laval University Faculty of Medicine. The following fifteen schools had no failures before state licensing boards: Stanford University School of Medicine, University of Colorado School of Medicine, School of Medicine of the Division of the Biological Sciences of the University

V 106
1936

	23 Mississippi	24 Missouri	25 Montana	26 Nebraska	27 Nevada	28 New Hampshire	29 New Jersey	30 New Mexico	31 New York	32 North Carolina	33 North Dakota	34 Ohio	35 Oklahoma	36 Oregon	37 Pennsylvania	38 Rhode Island	39 South Carolina	40 South Dakota	41 Tennessee	42 Texas	43 Utah	44 Vermont	45 Virginia	46 Washington	47 West Virginia	48 Wisconsin	49 Wyoming	50 U. S. Territories and Possessions*	Totals	Examined—Passed	Examined—Failed	Percentage Failed	No. Boards Examined by Marginal Number
	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F					
61	1 0																		78 2									85	83	2	2.4	4 61
62																	1 0		82 0									88	87	1	1.1	5 62
63						1 0		1 0													22 0							34	32	2	5.9	7 63
64						1 0			15 0			1 0			2 0				1 0				45 0	1 0	7 0	1 0	3 0	84	84	0	0.0	10 64
65						2 0													1 0				51 0		2 0			64	64	0	0.0	9 65
66	1 0					1 0			1 0			1 0													42 0		58	58	0	0.0	8 66
67	4 0					1 0			5 0		1 0		1 0	2 0	1 0					1 0					30 0		56	56	0	0.0	10 67
68									4 2		0 1	1 0													1 0		9	6	3	33.3	4 68
69												1 0				0 1											4	1	3	75.0	2 69
70						1 1			8 2						1 0	1 0								2 0				28	24	4	10.5	14 70
71									6 4	1 0		1 0																18	13	5	27.8	6 71
72									2 0															1 0				4	4	0	0.0	3 72
73																												6	5	1	16.7	2 73
74									0 1																			2	0	2	100.0	2 74
75	1 0					1 0			9 0						1 0	2 0	1 0							1 0		1 0		24	23	1	4.2	12 75
76									1 1			1 0			2 0													7	6	1	14.3	5 76
77	5 2			1 1		18 3			138 85		1 0	5 1	1 0		14 0	3 0			1 0	7 1	0 1	1 0		2 0	1 0	1 0		5 1	457	392	135	30.9	20 77
78									0 1								1 0						0 1					1 0	20	14	12	46.2	6 78
79	0 1 0 1					2 0			0 1			16 0	1 0			1 0		1 0		7 1								0 1	340	143	197	57.9	18 79
80	31	222	8	90	4	4	187	1	1,074	64	15	226	62	55	670	57	49	20	192	192	21	26	106	44	38	110	3	45	6,426	....	....	....	.. 80
81	30	214	8	90	3	4	182	1	979	64	14	205	62	55	664	53	49	20	181	186	20	26	105	44	38	110	3	40	....	5,841	....	....	.. 81
82	1	8	0	0	1	0	5	0	195	0	1	21	0	0	6	4	0	0	1	4	1	0	1	0	0	0	0	6	....	....	585	....	.. 82
83	3.2	3.6	0.0	0.0	25.0	0.0	2.7	0.0	16.2	0.0	6.7	1.0	0.0	0.0	1.3	7.0	0.0	0.0	0.6	2.1	4.8	0.0	0.9	0.0	0.0	0.0	0.0	13.0	....	....	....	9.1	.. 83
	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50					

P = Passed; F = Failed. * Alaska, Hawaii, Puerto Rico.

of Chicago, University of Kansas School of Medicine, Louisiana State University Medical Center, University of Nebraska College of Medicine, Albany Medical College, Duke University School of Medicine, Ohio State University College of Medicine, University of Oregon Medical School, Medical College of Virginia, University of Virginia Department of Medicine, Marquette University School of Medicine, University of Wisconsin Medical School and the University of Alberta Faculty of Medicine.

The 6,426 candidates examined do not represent individuals, since a candidate might possibly take the examination in more than one state and would be counted in each state. The same is true of the failures; but if a physician fails more than once in a given state within the year he is counted in that state only once as a failure.

Three of the five homeopathic boards in existence, Connecticut, Delaware and Maryland, examined twenty-one candidates, of whom nineteen passed. The homeopathic boards of Arkansas and Louisiana did not license any one during the year.

In 1934, 6,136 were examined, of whom 5,620 passed and 8.4 per cent failed, as compared with 6,426 examined in 1935, of whom 5,841 passed and 9.1 per cent failed. There were 290 more examined than in 1934, of whom 221 passed and 69 failed.

REGISTRATION BY RECIPROCITY AND ENDORSEMENT

The number of physicians granted licenses to practice medicine and surgery without examination in the states and territories are given in table 4. There were 2,165 so registered. These individuals presented licenses from other states, Canada and foreign countries, the certificate of the National Board of Medical Examiners, one of the government services, or other credentials.

Definite reciprocal agreements exist in many of the states but twenty-eight states and the District of Columbia register, without examination, licentiates who present credentials which correspond to those required by their respective states at the time such licenses were issued. These are:

Alabama	Michigan	Oklahoma
Arizona	Minnesota	Oregon
California	Missouri	Pennsylvania
Colorado	Nebraska	South Carolina
Connecticut	Nevada	South Dakota
Delaware	New Hampshire	Texas
District of Columbia	New Jersey	Utah
Idaho	New Mexico	Vermont
Maine	New York	Wisconsin
Maryland	North Carolina	

California (when ten or more years has intervened between the date of filing of an application for a California license and the date of the original license), Connecticut, Illinois, Minnesota, Nevada, North Carolina and South Dakota require a practical or oral examination of reciprocity or endorsement applicants before a license is granted by this method. Applicants in Idaho are required to pass either a written or an oral examination in medical jurisprudence as pertaining to practice in that state. Those desiring licenses in Arizona, Arkansas, Connecticut, the District of Columbia, Iowa, Minnesota, Nebraska, Oregon, Washington and Wisconsin are required to obtain a certificate from the board of examiners in the basic sciences before being eligible for licensure.

Florida, Massachusetts and Rhode Island do not have reciprocal or endorsement arrangements with any state. Massachusetts and Rhode Island, however, will register diplomates of the National Board of Medical Examiners by endorsement. Rhode Island requires such diplomates to pass an oral examination.

New York granted the greatest number of licenses by endorsement in 1935 (395), California was second with 143, New Jersey third with 136, Ohio fourth with

(CONTINUED ON PAGE 1483)

TABLE 3.—*Candidates Registered by Reciprocity and Endorsement—1935*

Marginal Number	SCHOOL	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	Totals	Marginal Number
		Alabama	Arizona	Arkansas	California	Colorado	Connecticut	Delaware	District of Columbia	Florida	Georgia	Idaho	Illinois	Indiana	Iowa	Kansas	Kentucky	Louisiana	Maine	Maryland	Massachusetts	Michigan	Minnesota	Mississippi	Missouri	Montana	Nebraska	Nevada	New Hampshire	New Jersey	New Mexico	New York	North Carolina	North Dakota	Ohio	Oklahoma	Oregon	Pennsylvania	Rhode Island	South Carolina	South Dakota	Tennessee	Texas	Utah	Vermont	Virginia	Washington	West Virginia	Wisconsin	Wyoming	U. S. Terr. & Poss.'		
	ARKANSAS																																																		
1	University of Arkansas School of Medicine	..	1	..	1	2	..	..	1	..	1	..	1	2	..	..	..	..	..	..	..	1	..	..	2	..	..	..	..	1	2	..	..	..	..	2	2	..	..	..	..	..	..	13	..	..	..	..	..	..	..	32	1
	CALIFORNIA																																																		
2	College of Medical Evangelists	..	4	..	2	2	..	..	..	..	..	1	1	1	..	1	..	1	1	2	5	1	..	..	1	..	..	..	..	1	..	4	2	1	1	1	..	..	..	1	..	..	1	..	..	5	..	..	3	..	..	43	2
3	Stanford University School of Medicine	..	1	..	1	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	2	..	..	1	..	..	1	..	..	..	..	..	..	1	..	..	..	..	..	..	7	3
4	University of California Medical School	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4	..	..	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	7	4
5	University of Southern California School of Medicine	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	5
	COLORADO																																																		
6	University of Colorado School of Medicine	..	..	..	5	1	1	..	..	..	..	..	1	1	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	1	1	..	3	..	..	..	..	..	..	..	..	..	..	1	..	..	2	2	..	..	1	15	6
	CONNECTICUT																																																	
7	Yale University School of Medicine	..	..	..	1	..	5	1	..	..	..	..	1	1	..	..	..	..	..	..	..	4	1	..	..	..	..	..	..	1	..	..	7	..	..	..	..	..	1	..	..	..	1	..	..	..	..	..	..	..	..	..	23	7
	DISTRICT OF COLUMBIA																																																	
8	George Washington University School of Medicine	..	..	..	1	..	..	..	..	..	1	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	1	..	..	..	1	..	5	..	..	..	..	..	1	..	..	..	1	..	..	1	..	..	1	..	..	..	13	8
9	Georgetown University School of Medicine	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	1	..	..	..	1	..	11	2	..	3	..	..	..	..	..	1	..	..	..	1	..	..	..	..	..	..	21	9
10	Howard University College of Medicine	..	..	..	..	..	1	..	..	..	..	..	1	..	..	..	..	..	..	..	..	2	..	..	..	..	1	..	..	..	1	..	4	..	..	2	..	..	..	..	..	..	..	..	..	3	..	..	..	..	..	..	15	10
	GEORGIA																																																		
11	Emory University School of Medicine	..	..	..	..	..	..	..	1	..	1	..	1	..	..	..	..	..	..	2	..	..	..	2	..	..	..	..	..	..	2	..	3	..	..	2	..	..	..	..	..	..	4	2	..	1	..	..	..	..	..	..	19	11
12	University of Georgia School of Medicine	..	..	..	1	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	2	..	..	..	..	..	..	..	..	1	2	1	..	..	1	..	..	..	..	..	10	12
	ILLINOIS																																																	
13	Loyola University School of Medicine	..	..	1	2	1	..	..	..	..	..	..	6	2	2	..	1	..	..	..	1	1	1	..	2	..	..	2	..	..	2	1	2	..	..	2	..	..	1	..	..	..	1	..	..	..	..	2	..	..	..	25	13
14	Northwestern University Medical School	..	2	6	6	1	..	..	..	..	..	..	6	2	..	..	2	..	1	..	1	1	1	1	2	..	1	2	..	..	3	1	3	2	1	2	1	..	..	..	..	1	..	..	2	1	1	1	..	..	52	14
15	University of Chicago, Rush Medical College	..	1	..	5	1	..	..	..	..	..	..	7	3	1	..	1	..	..	..	1	1	1	..	1	..	..	1	..	..	3	1	1	1	..	1	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	44	15
16	University of Chicago, The School of Medicine of the Division of the Biological Sciences	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	2	..	2	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	7	16
17	University of Illinois College of Medicine	..	..	1	9	4	..	..	..	..	..	1	..	6	1	2	1	..	..	..	1	1	2	..	4	..	..	..	..	1	2	1	1	..	1	1	..	..	..	..	..	1	4	2	..	..	3	1	..	..	..	56	17
	INDIANA																																																	
18	Indiana University School of Medicine	..	..	..	3	1	..	..	..	..	..	..	5	..	1	2	..	..	2	..	5	..	1	..	..	2	..	..	..	..	2	..	7	..	..	5	..	..	..	..	..	..	2	..	..	..	1	1	..	..	..	39	18
	IOWA																																																
19	State University of Iowa College of Medicine	..	1	1	7	..	..	1	..	..	1	..	5	1	..	3	..	..	..	..	1	..	2	1	..	1	..	5	..	..	7	..	5	..	..	6	..	3	..	..	..	2	1	..	1	..	1	..	..	..	..	52	19
	KANSAS																																																
20	University of Kansas School of Medicine	..	..	..	1	2	..	..	..	..	..	..	..	1	..	..	..	..	..	..	6	..	..	..	..	..	..	..	..	..	1	2	1	..	..	1	1	..	..	..	..	..	..	1	..	..	1	..	..	..	1	..	20	20
	KENTUCKY																																																
21	University of Louisville School of Medicine	4	..	..	..	..	..	..	..	..	..	..	2	6	..	2	..	..	..	..	1	..	2	6	..	..	1	..	2	..	..	1	..	..	..	3	..	..	..	..	..	..	1	1	1	..	4	..	2	..	..	40	21
	LOUISIANA																																																
22	Louisiana State University Medical Center	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	4	22
23	Tulane University of Louisiana School of Medicine	6	1	1	..	..	1	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	2	3	1	..	1	..	..	..	..	..	..	..	16	..	1	..	1	..	..	1	..	36	23
	MARYLAND																																																
24	Johns Hopkins University School of Medicine	..	..	..	3	..	..	..	3	..	..	1	2	1	..	2	..	1	2	1	2	1	..	..	..	..	..	..	..	3	..	13	3	..	4	1	..	5	..	..	1	..	3	..	..	3	1	1	..	..	1	57	24
25	University of Maryland School of Medicine and College of Physicians and Surgeons	..	..	..	1	..	1	1	1	..	1	..	1	1	..	1	..	1	1	..	1	..	..	..	..	..	..	..	..	3	1	14	..	..	..	..	..	3	1	..	..	..	1	..	1	5	..	3	..	..	..	49	25
	MASSACHUSETTS																																																
26	Boston University School of Medicine	..	..	..	1	..	..	..	..	..	..	1	..	1	..	..	..	..	1	..	4	..	..	..	..	..	..	..	..	1	1	..	3	..	..	..	..	..	5	..	1	1	..	..	..	..	..	..	..	..	..	..	17	26
27	Harvard University Medical School	1	..	..	10	..	1	..	..	..	..	..	5	..	1	1	..	2	..	22	1	..	..	..	..	1	1	..	..	2	..	15	1	..	6	..	..	7	..	..	..	..	2	3	3	1	..	..	1	..	1	96	27
28	Tufts College Medical School	..	..	..	1	..	2	..	..	..	..	..	1	..	..	..	..	..	..	11	..	..	1	..	..	..	..	..	..	..	6	..	5	..	..	..	..	..	1	..	..	..	..	1	..	1	..	..	..	..	..	..	31	28
	MICHIGAN																																																
29	University of Michigan Medical School	..	2	..	4	..	1	..	1	..	1	..	7	2	4	..	..	1	..	..	6	..	..	1	..	..	1	..	..	1	2	..	9	..	..	17	..	..	2	..	..	1	2	1	..	1	..	1	..	..	..	67	29
30	Wayne University College of Medicine	1	..	..	2	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	1	..	..	..	..	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9	30
	MINNESOTA																																																
31	University of Minnesota Medical School	..	..	..	9	1	..	..	1	..	..	..	4	..	2	..	..	..	..	..	2	..	..	1	4	1	..	..	..	..	2	..	3	1	..	1	..	..	..	..	..	..	2	..	..	1	5	..	1	1	..	40	31
	MISSOURI																																																
32	St. Louis University School of Medicine	..	1	..	1	1	..	..	..	..	..	..	2	1	..	1	..	..	1	1	..	..	..	..	2	..	..	..	..	..	2	..	6	..	2	16	..	..	1	..	..	..	1	..	..	1	1	1	..	..	..	..	57	32
33	Washington University School of Medicine	1	..	..	3	1	..	..	1	..	1	..	6	2	1	1	..	..	1	1	1	1	4	..	2	1	..	..	..	1	..	5	1	..	2	1	..	1	..	..	..	..	..	..	6	..	2	1	..	1	63	33

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TABLE 4.—*Physicians Licensed by Reciprocity and Endorsement—1935*

Marginal Number		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54
	Total Licensed	Alabama	Arizona	Arkansas	California	Colorado	Connecticut	Delaware	District of Columbia	Florida	Georgia	Idaho	Illinois	Indiana	Iowa	Kansas	Kentucky	Louisiana	Maine	Maryland	Massachusetts	Michigan	Minnesota	Mississippi	Missouri	Montana	Nebraska	Nevada	New Hampshire	New Jersey	New Mexico	New York	North Carolina	North Dakota	Ohio	Oklahoma	Oregon	Pennsylvania	Rhode Island	South Carolina	South Dakota	Tennessee	Texas	Utah	Vermont	Virginia	Washington	West Virginia	Wisconsin	Wyoming	U. S. Gov't Services	National Board of Medical Examiners	Hawaii, Puerto Rico	Canadian & Foreign	Miscellaneous
Alabama	20	..	..	..	..	..	..	..	..	..	1	..	1	..	..	..	3	7	..	..	..	2	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	1	..	..	..	..	..	1	..	..	..
Arizona	17	..	..	1	3	..	..	..	..	..	..	..	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	1	..
Arkansas	19	..	..	..	..	..	..	..	..	..	..	..	2	..	2	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	3	..	..	..	..	..	..	..	..	..	..	..	..
California	143	..	2	1	..	2	2	..	1	..	1	..	10	2	6	2	..	7	..	1	1	7	11	7	4	..	6	1	..	1	..	28	..	..	4	1	6	2	..	..	1	1	2	1	..	..	..	5	..	..	2	23	2	..	..
Colorado	34	1	..	2	2	..	..	..	..	..	..	..	6	1	2	5	1	..	..	..	..	..	1	..	1	..	2	..	..	..	..	1	..	..	..	..	..	1	..	3	1	..	2	1	..	1	..	..	..	..	..	..	..	..	..
Connecticut	44	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	3	..	..	..	..	..	..	..	..	1	7	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	2	23	..	..	..
Delaware	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Dist. Columbia	57	..	..	1	..	..	1	..	..	..	2	..	..	1	1	..	..	..	..	9	..	2	1	..	2	..	..	..	..	..	4	..	3	1	..	..	..	3	..	..	..	..	..	..	5	..	1	..	..	..	..	..	..	..
Florida	6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..
Georgia	16	..	..	1	..	..	..	..	..	..	..	..	..	..	..	1	..	1	..	2	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	1	3	..	..	..	..	..	..	..	..	..
Idaho	12	..	..	..	2	..	..	..	..	..	..	..	..	1	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Illinois	101	..	..	1	5	1	..	..	..	..	..	..	8	5	..	1	2	..	..	2	..	7	6	..	16	..	4	..	..	..	1	..	..	1	..	6	1	..	..	..	..	..	..	..	..	..	..	6	..	..	19	..	..	..
Indiana	44	..	..	2	1	2	..	..	..	..	1	..	8	..	2	1	6	..	1	..	..	2	1	..	2	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..
Iowa	20	..	..	..	..	..	..	..	..	..	..	..	7	..	..	1	..	1	..	..	..	5	2	..	1	..	..	..	..	..	1	..	..	..	1	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	2	..	..	..
Kansas	34	..	..	..	1	1	..	..	..	..	..	..	2	1	6	..	..	..	..	2	..	..	1	..	7	2	2	..	..	..	..	..	..	1	1	8	..	..	2	..	2	..	..	11	1	..	1	..	2	..	..	2	..	..
Kentucky	30	..	..	1	..	..	..	..	..	..	..	..	1	9	..	..	..	..	..	..	..	1	..	..	1	..	1	10	..	..	1	..	..	1	2	..	..	..	..	..	..	..	2	1	..	..	..	..	..	..	..	..	..	..
Louisiana	6	..	..	..	1	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	1	..	1	..	1	2	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..
Maine	16	..	..	..	1	..	..	..	2	..	2	..	1	1	..	..	..	..	..	..	..	1	..	..	1	..	..	..	..	..	1	..	1	..	..	..	..	..	..	..	..	..	3	..	4	..	..	..	..	..	1	..	..
Maryland	33	..	..	..	1	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	1	..	..	1	..	..	..	..	..	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	26	..	..	..
Massachusetts	68	..	..	..	1	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	1	..	..	6	..	3	..	..	..	..	..	..	..	5	..	..	2	..	..	..	..	1	..	..	..	..	..	2	..	..	..	..	..
Michigan	37	1	..	1	1	..	1	..	..	..	..	..	17	6	1	..	..	..	..	2	..	..	..	..	6	..	3	..	..	..	..	..	..	..	1	..	..	2	..	..	..	..	1	..	..	..	..	..	1	..	..	7	..	..	..
Minnesota	14	..	..	..	..	1	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..
Mississippi	17	2	..	..	..	..	..	..	..	..	2	..	1	..	..	..	2	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	2	..	..	..
Missouri	51	..	..	2	..	2	..	..	..	..	..	..	6	2	3	10	5	..	..	..	..	1	1	1	1	..	3	..	..	..	..	..	..	1	1	1	..	..	..	..	..	..	..	6	..	..	..	2	1	..	..	3	..	..
Montana	16	..	..	..	1	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	2	6	..	2	..	1	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	1	..	..	..
Nebraska	12	..	..	..	..	..	..	..	..	..	..	..	1	2	1	..	..	..	..	1	..	1	1	..	..	1	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	1	..	..	..	2	..	..	..	..	..	..
Nevada	15	..	..	..	6	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	1	1	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..
New Hampshire	34	..	..	..	..	..	..	..	..	..	..	..	1	2	2	1	..	..	1	3	..	9	1	4	2	..	6	..	..	..	..	2	1	..	1	..	..	17	1	1	..	..	3	..	2	5	..	1	..	..	15	..	..	..
New Jersey	126	..	..	1	..	1	..	2	..	..	..	..	4	..	1	2	..	2	..	..	..	2	..	..	..	1	..	..	..	..	1	..	..	..	1	..	..	..	..	..	..	..	17	4	..	1	12	..	1	1	..	126	2	77	1
New Mexico	28	..	..	2	1	2	1	..	..	..	..	..	1	2	..	1	2	..	..	..	..	2	..	..	..	..	1	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	9	2	..	..	5	..	..	..	..	6	..	..	..
New York	265	1	..	..	5	1	2	..	1	..	1	..	8	7	7	1	1	2	..	2	..	42	5	6	4	..	9	1	4	2	..	30	..	47	1	..	4	..	29	1	..	9	2	..	1	8	..	3	..	2	15	..	..	..
North Carolina	46	..	..	..	1	..	..	..	..	..	7	..	..	1	..	1	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..
North Dakota	9	..	..	..	1	..	..	..	..	..	..	..	..	2	..	1	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	1	2	..	..	..	..	..	..	..	14	..	1	..	3	..	2	2	..	12	..	..	..
Ohio	132	1	..	2	1	2	1	..	..	..	1	..	9	8	5	1	5	..	..	..	..	2	..	..	19	..	1	..	..	..	1	..	6	2	..	..	..	1	..	..	..	..	3	..	3	..	..	..	..	..	12	..	..	..
Oklahoma	29	..	..	2	..	..	..	..	..	..	..	..	2	..	2	1	1	..	..	1	..	..	4	..	1	..	2	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	2	..	..	..
Oregon	11	..	..	..	3	..	..	..	..	..	..	..	2	..	2	1	..	..	..	1	..	..	1	..	..	..	..	..	..	..	..	..	1	1	..	2	..	..	1	..	..	..	2	..	1	..	..	1	..	..	1	18	..	..	..
Pennsylvania	61	..	..	..	..	..	..	1	..	..	1	..	8	..	..	..	..	1	..	6	2	3	..	..	7	2	6	..	..	..	1	5	..	1	2	..	..	1	..	..	..	..	1	..	..	1	..	..	..	..	1	..	..	..
Rhode Island	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	6	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..
South Carolina	7	..	..	..	1	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
South Dakota	10	..	..	..	1	..	..	..	..	..	..	..	..	..	4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	4	..	..	..
Tennessee	24	1	..	..	..	..	..	..	..	..	..	6	..	..	..	..	2	..	..	1	..	1	..	2	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	1	..	..	2	..	1	..	2	..	2	..	..	..
Texas	118	..	1	13	..	1	..	..	1	1	2	..	7	2	..	4	1	10	..	2	1	5	1	..	6	..	6	..	2	..	..	..	..	4	11	..	..	..	..	..	..	9	..	..	..	..	..	..	..	..	2	..	..	..
Utah	13	..	..	..	1	..	..	..	..	..	..	..	..	3	..	2	..	..	..	..	2	..	1	6	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	2	..
Vermont	16	..	..	..	..	..	..	..	..	..	..	..	1	..	1	..	..	..	..	..	..	1	4	1	5	..	..	..	..	2	..	..	..	2	2	..	1	..	..	1	..	..	6	1	..	..	..	4	2	..	10	..	..	..
Virginia	68	1	..	..	..	1	..	..	..	..	1	..	..	..	..	..	1	4	1	5	..	..	..	..	7	..	2	..	3	..	..	..	..	..	..	1	6	1	..	1	..	..	1	1	..	1	..	..	..	..	13	..	..	..
Washington	42	..	..	..	1	2	..	..	..	..	..	1	4	..	1	..	..	1	..	1	..	..	1	..	2	..	..	..	..	..	..	..	..	..	2	..	1	..	..	1	..	..	..	..	..	..	15	..	..	..	3	..	..	..
West Virginia	42	..	..	..	..	..	..	1	..	1	..	1	..	2	..	1	..	1	..	1	..	1	..	1	1	..	3	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	1	..	..	..	1	..	..	1	..	..	..	..
Wisconsin	21	..	..	..	..	..	..	..	..	..	..	..	..	9	..	2	..	..	..	1	..	1	1	..	..	..	3	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	1	..	..	..	2	..	..	..	1	..	..	..
Wyoming	12	..	..	..	1	..	..	..	..	..	..	..	1	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
U. S. Terr. and Possessions*	15	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	10	..	..	..
Totals	2,165	6	4	35	61	25	9	5	6	1	32	2	123	51	63	30	30	42	4	101	24	81	58	6	98	2	50	1	2	29	0	118	21	5	79	22	17	64	6	10	2	126	21	11	12	66	9	14	22	1	11	442	5	81	1
Marginal Number		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54

* Alaska, Hawaii, Puerto Rico, Virgin Islands.

V 106
1936

(CONTINUED FROM PAGE 1479)

132, Texas fifth with 118 and Illinois sixth with 101. All other states licensed fewer than 100. The largest group representing the same type of credentials were the 442 diplomates of the National Board of Medical Examiners; the next greatest number (126) came from Tennessee; Illinois was third with 123; New York was fourth with 118, and Maryland was fifth with 101. Only 118 New York licenses were endorsed during the year, while 395 were licensed on the basis of credentials. Of the latter, sixty-nine were registered on the basis of foreign licenses or diplomas giving the right to practice in the country in which issued.

Twelve physicians were licensed on the basis of Canadian credentials (both provincial and dominion) in four states: Arizona one, Maryland one, New York eight and Vermont two. New York was the only state in which physicians were registered by endorsement of European credentials. Sixty-nine were so licensed representing the following countries: Austria one, England two, France one, Germany fifty-nine, Hungary one, Ireland one, Italy two, Latvia one and Netherlands one. Two physicians were registered in California by the endorsement of certificates from Hawaii and three in New York on the basis of licenses issued in Puerto Rico.

One candidate was licensed by the homeopathic board in Maryland.

Not included in the table are fifteen osteopaths licensed by the board of medical examiners in two states; namely, thirteen granted the right to practice medicine and surgery in Texas, and two permitted the privilege of practicing surgery in Wyoming.

Diplomates of the National Board of Medical Examiners were registered in thirty-nine states, Alaska and Hawaii.

Illinois licentiates were registered in thirty states, while the state that had the highest number of its licenses endorsed, Tennessee, had its 126 licentiates registered in twenty-nine states; seventeen went to New York State. New York had the greatest number of its licentiates registered in any one state, forty-seven, who were given the right to practice in New Jersey; forty-two licentiates of Maryland went to New York State. Alabama, Arizona, Connecticut, Delaware, District of Columbia, Florida, Idaho, Maine, Mississippi, Montana, Nevada, New Hampshire, North Dakota, Rhode Island, South Dakota, Washington, Wyoming, Hawaii and Puerto Rico had less than ten of their licentiates endorsed to other states and New Mexico had none.

In table 3, the 2,165 physicians and 15 osteopaths registered by reciprocity and endorsement are recorded by school of graduation and state or territory where licensed. All of the existing United States medical schools and seven of the nine Canadian schools were represented. The largest number of graduates of any one school were from Harvard University Medical School, 96; the University of Michigan Medical School had 67 registered by this method; Rush Medical College 64; the University of Illinois College of Medicine and the University of Tennessee College of Medicine, 59 each, Northwestern University Medical School and Johns Hopkins University School of Medicine, 57 each. Graduates of 47 foreign medical faculties, 47 extinct medical schools and 1 unapproved institution were licensed without examination. Thirteen osteopaths were granted the right to practice medicine and surgery in Texas and two permitted the privilege of practicing surgery in Wyoming. There were 111 graduates of foreign medical faculties registered, 71 from extinct medical schools and one graduate of an unapproved institution.

CANDIDATES ADDED TO THE PROFESSION

In table 5 are recorded the number of candidates added to the profession during 1935. The number represents candidates examined in 1935 and licensed; also those examined in previous years whose licenses were withheld and issued in 1935, those certified on the basis of the certificate of the National Board of Medical Examiners, government services, Canadian and foreign credentials, and miscellaneous. In the main they represent recent graduates. Altogether, 5,500 were added to the profession as contrasted with approximately 4,000, the number removed by death in 1935. These figures indicate that at least 1,500 have been added to the already overcrowded medical profession. It is assumed that by far the great majority of those licensed are in practice. It is interesting to note that, of 7,887 licenses issued throughout the year, 5,500, 69.7 per cent, are actual additions to the medical profession. The largest number added to the profession was in New York, 1,022; Pennsylvania added 439 and Illinois 418; Nevada, New Mexico and Wyoming added two. In 1934 there were 5,451 added to the profession. Forty-nine more were added in 1935. Of the figure for 1935, 5,090 were licensed after examination and 410 by endorsement of credentials representing principally those who presented the certificate of the National Board of Medical Examiners.

TABLE 5.—*Licentiates Representing Additions to the Medical Profession—1935*

	Examination	Endorsement	Total
Alabama	88	0	88
Arizona	4	2	6
Arkansas	61	0	61
California	300	12	312
Colorado	58	2	60
Connecticut	39	19	58
Delaware	8	2	10
District of Columbia	21	0	21
Florida	38	0	38
Georgia	87	0	87
Idaho	5	0	5
Illinois	407	11	418
Indiana	101	0	101
Iowa	91	3	94
Kansas	91	1	92
Kentucky	72	2	74
Louisiana	97	0	97
Maine	32	5	37
Maryland	142	5	147
Massachusetts	147	55	202
Michigan	212	0	212
Minnesota	121	6	127
Mississippi	23	0	23
Missouri	184	2	186
Montana	6	1	7
Nebraska	80	0	80
Nevada	2	0	2
New Hampshire	4	4	8
New Jersey	160	0	160
New Mexico	1	1	2
New York	834	188	1,022
North Carolina	63	4	67
North Dakota	6	1	7
Ohio	279	10	289
Oklahoma	55	1	56
Oregon	50	1	51
Pennsylvania	426	13	439
Rhode Island	31	1	32
South Carolina	40	0	40
South Dakota	9	0	9
Tennessee	175	4	179
Texas	185	12	197
Utah	20	2	22
Vermont	19	7	26
Virginia	104	8	112
Washington	34	7	41
West Virginia	24	1	25
Wisconsin	101	0	101
Wyoming	2	0	2
U. S. Territories and Possessions*	21	8	29
Totals	5,080	410	5,500
Totals for 1934	5,025	426	5,451

* Alaska, Hawaii, Puerto Rico

STATE REQUIREMENTS OF PRELIMINARY EDUCATION

The minimum requirement of preliminary education exacted by the Council on Medical Education and Hospitals since 1918 has been two years of college work. There are still eight states, however, which have not revised or amended their statutes to conform with this prerequisite, although these same states, with possibly

TABLE 6.—*State Requirements of Premedical Training*

Two Years of College		
Alabama	Maine	Oregon
Arizona	Maryland	Rhode Island
Arkansas	Michigan	South Carolina
Colorado	Minnesota	South Dakota
District of Columbia	Mississippi	Tennessee
Florida	Montana	Texas
Georgia	Nevada	Utah
Idaho	New Hampshire	Vermont
Illinois	New Jersey	Virginia
Indiana	New Mexico	Washington
Iowa	New York	West Virginia
Kansas	North Carolina	Wisconsin
Kentucky	North Dakota	Wyoming
Louisiana	Oklahoma	
One Year of College		
California	Connecticut	Pennsylvania
High School Graduation or its Equivalent		
Delaware	Missouri	Ohio
Massachusetts	Nebraska	

one or two exceptions, do not license other than graduates of approved schools. Table 6 records the premedical training required in each state.

REQUIRED INTERNSHIP

Since 1914 seventeen states, Alaska and the District of Columbia have required that applicants for licensure possess a hospital internship. The first state exacting the internship was Pennsylvania and the last one Ver-

TABLE 7.—*Internship Required by Medical Licensing Boards*

Alaska	1917	Pennsylvania	1914
Delaware	1924	Rhode Island	1917
District of Columbia	1920	South Dakota	1923
Utah	1923	Utah	1926
Iowa	1924	Vermont	1934
Michigan	1922	Washington	1929
New Jersey	1916	West Virginia	1932
North Dakota	1918	Wisconsin	1927
Oklahoma	1923	Wyoming	1931
Oregon	1923		

mont, affecting the graduates of 1934 and thereafter. A list of the states and others demanding the internship with the effective dates are shown in table 7.

CANDIDATES EXAMINED FROM 1931 TO 1935 INCLUSIVE

In table 8 are listed the number of candidates examined in the various states, territories and possessions in the last five years, 1931-1935 inclusive, showing those who passed and failed. In this period New York licensed 4,015 candidates, Pennsylvania 2,263, Illinois 1,885, California 1,539, Ohio 1,370, Michigan 1,141 and Massachusetts 1,043. All other states licensed less than 1,000. Thirty-one states licensed less than 500 and eleven states less than 100. The smallest number (six) were examined in New Mexico. The percentage of candidates who failed in the examinations in the past five years is given in the last column. The proportion of failures in all states has increased from 6.2 per cent in 1931 to 9.1 per cent in 1935. In the five year period, 44.1 per cent of the applicants failed in Massachusetts. The high percentage in this state is due to the fact that by law the licensing board is required to admit to its examination the graduates of unapproved schools, many of whom repeatedly fail. The next highest proportion of failures was in New York with 17.6 per cent. The comparatively high percentage in this state is occasioned by the fact that New York admits a great many graduates of foreign medical schools to its licensing examination. Delaware had 17.1 per cent failures, Nevada 16.7 per cent, Connecticut 14.5 per cent and Florida 12.9 per cent. Florida has no reciprocal relations with any state, all candidates applying being required to take the licensing examinations. Graduates of earlier years, it appears, experience difficulty in passing examinations. On the other hand, Alabama, Kansas, Montana, Nebraska, New Hampshire, New Mexico, Oklahoma, South Carolina, South Dakota, Vermont and Washington—eleven states—had no failures. Arkansas, California, Colorado, District of Columbia, Georgia, Idaho, Illinois,

TABLE 8.—*Candidates Examined—1931-1935, Inclusive*

	1931		1932		1933		1934		1935		Totals for 5 Years		
	Passed	Failed	Passed	Failed	Passed	Failed	Passed	Failed	Passed	Failed	Passed	Failed	Percentage Failed
Alabama	29	0	34	0	11	0	29	0	37	0	111	0	0.0
Arizona	20	1	14	2	9	1	7	2	8	2	58	8	12.1
Arkansas	29	0	43	0	44	1	53	0	42	0	211	1	0.5
California	324	14	290	15	294	13	303	16	328	14	1,539	72	4.5
Colorado	66	2	59	2	69	0	65	2	59	1	318	7	2.7
Connecticut	66	4	68	12	61	15	70	12	61	13	330	56	14.5
Delaware	12	0	6	0	16	1	14	7	13	5	61	13	17.1
Dist. of Columbia	27	0	43	1	39	1	50	1	43	1	202	4	1.9
Florida	55	5	66	0	69	3	105	27	135	24	441	63	12.9
Georgia	77	0	100	0	80	1	80	0	86	2	423	3	0.7
Idaho	5	0	5	0	5	0	13	0	7	1	35	1	2.8
Illinois	365	24	380	28	369	14	368	13	423	10	1,885	89	4.5
Indiana	124	0	110	1	114	6	142	4	115	4	605	15	2.4
Iowa	109	1	115	0	110	1	109	0	77	0	511	3	0.6
Kansas	74	0	76	0	80	0	88	0	84	0	422	0	0.0
Kentucky	64	1	69	0	69	0	80	2	81	0	363	3	0.8
Louisiana	102	1	111	3	119	0	122	0	134	0	588	4	0.7
Maine	30	0	30	0	35	0	35	0	45	1	175	1	0.6
Maryland	153	3	176	5	165	2	204	17	194	28	892	55	5.8
Massachusetts	213	104	208	132	180	177	238	170	197	230	1,043	822	44.1
Michigan	209	0	219	0	194	0	225	2	283	2	1,141	4	0.4
Minnesota	130	0	142	0	126	1	139	0	173	0	750	1	0.1
Mississippi	35	0	37	0	34	0	28	1	30	1	164	2	1.4
Missouri	157	0	156	0	213	0	186	2	214	6	926	10	1.1
Montana	7	0	6	0	4	0	9	0	4	0	30	0	0.0
Nebraska	57	0	67	0	66	0	56	0	56	0	302	0	0.0
Nevada	2	0	4	1	1	1	5	0	3	1	15	3	16.7
New Hampshire	6	0	9	0	10	0	6	0	4	0	35	0	0.0
New Jersey	91	5	113	7	153	9	175	10	182	5	714	36	4.8
New Mexico	1	0	1	0	0	0	1	0	3	0	6	0	0.0
New York	839	146	717	179	747	146	854	193	879	195	4,015	859	17.6
North Carolina	74	0	87	1	65	0	74	0	64	0	364	1	0.3
North Dakota	16	1	21	0	14	2	12	1	14	1	77	5	6.1
Ohio	250	7	270	10	285	7	261	9	295	21	1,370	53	3.4
Oklahoma	51	0	60	0	60	0	73	0	62	0	312	0	0.0
Oregon	40	1	31	1	39	0	36	0	55	0	198	2	1.0
Pennsylvania	419	6	456	8	456	12	468	10	664	6	2,263	42	1.8
Rhode Island	36	0	40	1	38	0	34	0	33	4	181	11	5.7
South Carolina	47	0	40	0	38	0	46	0	49	0	220	0	0.0
South Dakota	16	0	12	0	14	0	10	0	20	0	72	0	0.0
Tennessee	108	3	100	1	141	0	173	0	151	1	683	5	0.6
Texas	134	1	147	0	166	0	165	2	198	4	810	6	1.9
Utah	10	0	24	0	9	0	29	0	20	1	92	1	1.2
Vermont	20	0	23	0	27	0	30	0	26	0	126	0	0.0
Virginia	101	2	115	3	146	1	130	4	105	1	597	11	1.8
Washington	35	0	42	0	41	0	35	0	44	0	197	0	0.0
West Virginia	36	2	37	1	40	2	25	0	36	0	156	5	3.1
Wisconsin	98	11	116	3	115	5	118	4	110	0	557	23	4.0
Wyoming	5	0	2	0	2	0	1	1	3	0	13	1	7.1
U. S. Terr. & Possessions	116	2	104	4	38	4	29	4	40	6	329	20	5.7
Totals	5,609		5,686		5,664		6,136		6,426		29,500		
Totals—Examined	5,360		5,238		5,235		5,620		5,841		27,194		
Passed	348		428		429		516		585		2,306		
Failed	6.2		7.6		7.6		8.4		9.1		7.8		
Percentage Failed													

Indiana, Iowa, Kentucky, Louisiana, Maine, Michigan, Minnesota, Mississippi, Missouri, New Jersey, North Carolina, Ohio, Oregon, Pennsylvania, Tennessee, Texas, Utah, Virginia, West Virginia and Wisconsin—twenty-seven states—had less than 5 per cent of failures. A total of 29,500 candidates were examined in the five years from 1931 to 1935 inclusive, of whom 27,194 passed and 2,306 failed, 7.8 per cent. These

V 106
1936

figures represent examinations given and not individuals. A candidate who fails more than once in a given year has not been counted twice, but should he fail in one of the succeeding years in another state he is counted in that year also. Likewise, if a candidate fails and later passes, whether in the same or a later year, he is counted as passed and failed. With a total of 2,306 failures for the five year period, it seems likely that there were approximately 27,000 individuals examined. It is to be assumed that the majority of those who fail are later reexamined and licensed in some state. This figure gives a fair estimate of the number of physicians added to the profession each year. Table 5 gives exact totals on this point for the years 1934 and 1935. From this table it can be seen that there has been a gradual increase in the number of physicians examined.

REGISTRATION 1904-1935

A study of totals and percentages (table 9) for each year beginning with 1904 is of interest. The number (5,841) who passed in 1935 was 221 more than the number who passed in 1934 and only 165 more than in 1904. The number licensed without examination, 2,180, was forty-one more than in 1934. Contrasting these figures with those for 1904 will show the great use being made of this system of licensure. By all methods, 8,021 were registered, 262 more than in 1934. This figure represents the largest number of candidates registered since 1904.

TABLE 9.—*Registration—1904-1935*

Year	All Candidates Examined		Registered Without Written Examination	Total Registered
	Passed	Percentage Failed		
1904	5,676	19.4	999	6,675
1905	5,882	20.7	804	6,686
1906	6,388	20.6	1,469	7,857
1907	5,721	21.3	1,427	7,148
1908	5,687	21.7	1,561	7,248
110	5,882	19.6	1,373	7,256
1910	5,715	18.4	1,640	7,355
1911	5,583	19.8	1,888	7,471
1912	5,488	20.5	1,871	6,757
1913	5,220	18.6	1,221	6,341
1914	4,570	21.5	1,268	5,838
1915	4,597	13.5	1,284	5,881
1916	4,145	14.9	1,251	5,396
1917	4,063	14.1	1,399	5,462
1918	3,189	13.5	1,046	4,235
1919	4,674	14.5	2,543	6,617
1920	4,660	15.5	2,554	6,614
197	5,225	12.4	2,161	6,486
1922	5,537	12.9	2,085	5,689
192	4,926	14.6	2,286	6,424
1924	4,733	11.8	1,910	6,643
192	5,445	9.2	1,949	7,394
192	5,389	7.9	1,889	7,288
1927	4,995	7.3	2,170	7,165
1928	5,084	6.8	2,227	7,311
1929	5,279	6.2	2,416	7,695
1930	5,247	5.7	2,362	7,609
1931	5,389	6.5	2,209	7,489
1932	5,520	7.0	1,975	7,113
1933	5,575	7.8	1,980	7,255
1934	5,620	8.4	2,139	7,759
1935	5,841	9.1	2,180	8,021

Of those examined 9.1 per cent failed in 1935, while 8.4 per cent failed in 1934. While these figures represent those registered in the years given, they do not in all states represent the number licensed in a given year. Licenses are withheld in many states, as indicated in the text describing table 1.

It will be seen that there has been no constant increase or decrease in the total number of candidates registered from 1904 to 1933, although since 1906 the number licensed without examination has been increasing owing to the universal system of endorsement and the recognition of the certificate of the National Board of Medical Examiners. The decrease in the number registered in 1918 was due to the sudden withdrawal of physicians and recent graduates from civilian life. Again in 1922 there was a notable reduction, this figure representing the small class that began the study of medicine in 1918. There was, however, a substantial increase in the number registered in 1934 and a still larger increase in 1935, the majority having been by examination. This is probably accounted for by the fact that medical schools are graduating larger classes, 5,035 in 1934 and 5,101 in 1935. The enrolment in medical schools for the present college session and subsequent years in many cases has been and will be reduced.

TABLE 10.—*Source of Physicians Registered—1922-1935*

Date	Graduates of Approved Schools		Others		Totals
	Number	Per Cent	Number	Per Cent	
1922	4,513	80.6	1,087	19.4	5,600
192	5,193	80.8	1,231	19.2	6,424
1924	5,679	85.2	984	14.8	6,663
192	6,382	86.4	999	13.6	7,394
192	6,426	88.7	862	11.3	7,288
1927	6,405	89.4	739	10.6	7,165
1928	6,584	90.1	727	9.9	7,311
1929	6,989	91.0	695	9.0	7,695
1930	7,007	92.1	602	7.9	7,609
1931	6,928	92.5	561	7.5	7,489
1932	6,666	93.7	447	6.3	7,113
1933	6,749	93.1	454	6.3	7,203
1934	7,148	92.1	611	7.9	7,759
193	7,343	91.5	678	8.5	8,021

SOURCE OF PHYSICIANS REGISTERED

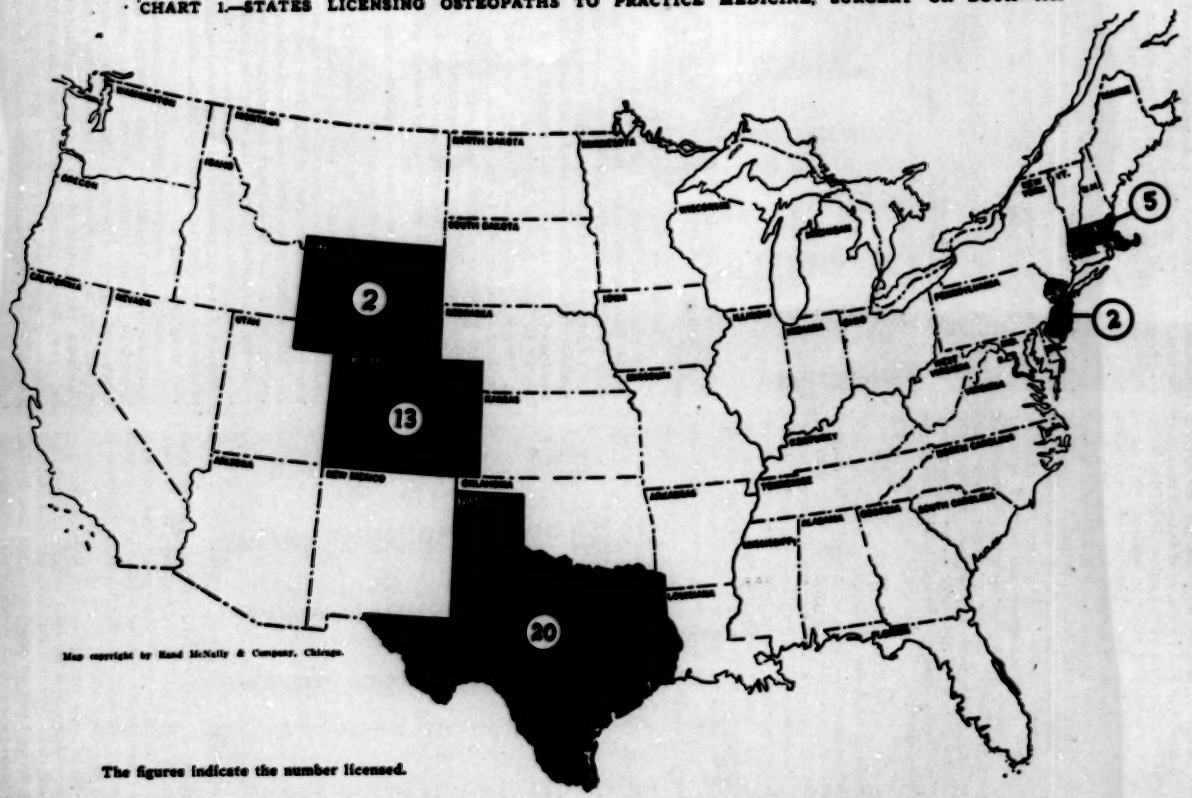
The educational fitness of the individuals registered in the last fourteen years, 1922-1935, is shown in table 10. Of the 8,021 registered by all methods in 1935, 7,343, or 91.5 per cent, graduated from approved medical schools and there were 678, 8.5 per cent, other practitioners registered. In the computation of these figures, all schools rated as class A and B by the Council on Medical Education and Hospitals since 1907 are classified as approved. In the column "Others" are included graduates of institutions prior to 1907, of foreign medical faculties, class C graduates, undergraduates, osteopaths and graduates of schools that have been refused all recognition as medical schools.

GRADUATES OF OTHER THAN APPROVED MEDICAL SCHOOLS REGISTERED

In table 11 will be noted the total number of graduates of osteopathic colleges and those institutions which have been classified as unapproved, who were registered with or without examination in 1933, 1934 and 1935. In 1935, thirteen states registered 123 graduates of unapproved medical schools and five states registered forty-two osteopaths, granting the latter the privilege of practicing medicine, surgery or both. Of those examined, 114 were graduates of unapproved medical schools and twenty-seven were osteopaths, while two were undergraduates.

The number of unapproved graduates increased by twenty the number registered in 1934. One each was licensed in Florida, Indiana, North Dakota, Rhode Island and South Dakota. Undergraduates were licensed, one each, in Kentucky (limited license) and Oklahoma (by petition to the governor). Missouri and New Mexico licensed two and California three unapproved graduates. The sixteen who were registered in Ohio are graduates of the Eclectic Medical College of Cincinnati, an unapproved institution. More recently the school has determined to enroll no new

CHART 1.—STATES LICENSING OSTEOPATHS TO PRACTICE MEDICINE, SURGERY OR BOTH—1935



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The figures indicate the number licensed.

V 106
1936

students in the school and to discontinue teaching when the present freshman class is graduated.

The twenty-six registered in Massachusetts represented two unapproved colleges located in that state and a few elsewhere. This state by law is required to admit to its examination a graduate of any chartered medical school. Sixty-seven graduates of the Chicago Medical School, an unapproved institution, were registered in Illinois. While twenty-six graduates of unapproved schools were registered by examination in Massachusetts, there were 138 failures, 84 per cent.

In the three year period shown, 292 graduates of unapproved schools and undergraduates were registered by examination and twenty-two by endorsement.

Forty-two osteopaths were licensed to practice medicine and surgery by examination and endorsement in five states, twenty-seven after examination and fifteen by endorsement during 1935. These osteopaths were registered in Colorado, Massachusetts, New Jersey, Texas and Wyoming. As shown by table 2, fifty-two osteopaths failed of registration by examination: forty-seven in Massachusetts, one each in Colorado and Texas, and three in Connecticut. In this connection the following facts are of interest:

In Colorado, osteopaths are admitted to the examination for a license to practice medicine. They have no separate board. The statute of Colorado is silent with respect to the scope of practice authorized by a license issued to osteopaths.

The Connecticut statute provides that any registered osteopath may practice either medicine, surgery or both, as the case may be, after passing a satisfactory examination before the medical examining board.

The Massachusetts statute, by definition, includes osteopathy in the practice of medicine and does not differentiate the type of license issued to an osteopathic applicant. The medical practice act requires that any applicant for a license to practice must be in possession of a degree of doctor of medicine, or its equivalent, from a legally chartered medical school that gives a full four-year course of instruction of not less than thirty-two weeks in each year.

Osteopaths who are duly registered and licensed to practice osteopathy in the state of New Jersey, who present three years of practice of surgery in a hospital approved by the board of medical examiners, may be admitted to the examination to be licensed to practice medicine and surgery.

The statutes of Texas provide for the issuing of a license to practice medicine only. So far as the statutes indicate, the osteopaths are not restricted in their field of practice.

In Wyoming, osteopaths are granted the right to practice surgery.

In the three year period shown, a total of 476 licenses were granted to either graduates of unapproved medical schools or osteopaths. It is to be regretted that such persons are granted the right to practice. The medical profession should be ever watchful and untiring in its efforts to prevent osteopaths and others from gaining the legal right to practice medicine or surgery, for which their training is wholly inadequate. Fewer osteopaths were registered in 1935 than in the previous two years but twenty more graduates of unapproved schools than in 1934.

TABLE 11.—*Graduates of Other Than Approved Medical Schools Registered—1933-1935*

	Examination						Reciprocity and Endorsement						
	Osteopaths			Graduates of Unapproved Schools and Undergraduates			Osteopaths			Graduates of Unapproved Schools and Undergraduates			
	1933	1934	1935	1933	1934	1935	1933	1934	1935	1933	1934	1935	Totals
Alabama	0	0	0	0	0	0	0	0	0	1	0	0	1
Arkansas	0	0	0	1	1	0	0	0	0	1	0	0	2
California	0	0	0	0	1	1	0	0	0	0	0	2	4
Colorado	8	10	13	0	0	0	0	0	0	0	0	0	31
Connecticut	2	1	0	0	0	0	0	0	0	0	0	0	3
District of Columbia	0	0	0	0	0	0	1	0	0	0	0	0	1
Florida	0	0	0	0	1	0	0	0	0	0	0	1	2
Idaho	0	0	0	0	0	0	0	0	0	0	1	0	1
Illinois	0	0	0	26	25	67	0	0	0	0	0	0	118
Indiana	0	0	0	0	0	1	0	0	0	0	0	0	1
Kansas	0	0	0	0	1	0	0	0	0	0	0	0	1
Kentucky	0	0	0	1	1	1	0	0	0	0	0	0	3
Massachusetts	15	21	5	26	34	28	0	0	0	0	0	0	129
Michigan	0	0	0	0	0	0	0	0	0	1	0	0	1
Mississippi	0	0	0	0	1	0	0	0	0	0	1	0	2
Missouri	0	0	0	1	0	0	0	0	0	0	0	2	3
New Jersey	0	0	2	0	0	0	0	0	0	1	4	0	7
New Mexico	0	0	0	0	0	0	0	0	0	1	0	2	3
North Dakota	0	0	0	0	0	0	0	0	0	0	1	0	1
Ohio	0	0	0	0	0	16	0	0	0	0	1	0	17
Oklahoma	0	0	0	0	0	1	0	0	0	0	0	0	1
Rhode Island	0	0	0	0	0	1	0	0	0	0	0	0	1
South Dakota	0	0	0	0	0	1	0	0	0	0	0	0	1
Tennessee	0	0	0	1	0	0	0	0	0	1	0	0	2
Texas	4	7	7	0	0	0	13	17	13	0	2	0	63
Washington	0	0	0	1	0	0	0	0	0	0	0	0	1
Wisconsin	0	2	0	0	0	0	0	0	0	0	0	0	2
Wyoming	0	0	0	0	0	0	0	1	2	0	0	0	3
Alaska	0	0	0	1	1	0	0	0	0	0	0	0	2
Totals	35	41	27	62	94	118	23	21	15	6	9	7	476

The results of the medical school survey being conducted by the Council on Medical Education and Hospitals in cooperation with the Association of American Medical Colleges and the Federation of State Medical Boards of the United States should be of assistance to licensing boards.

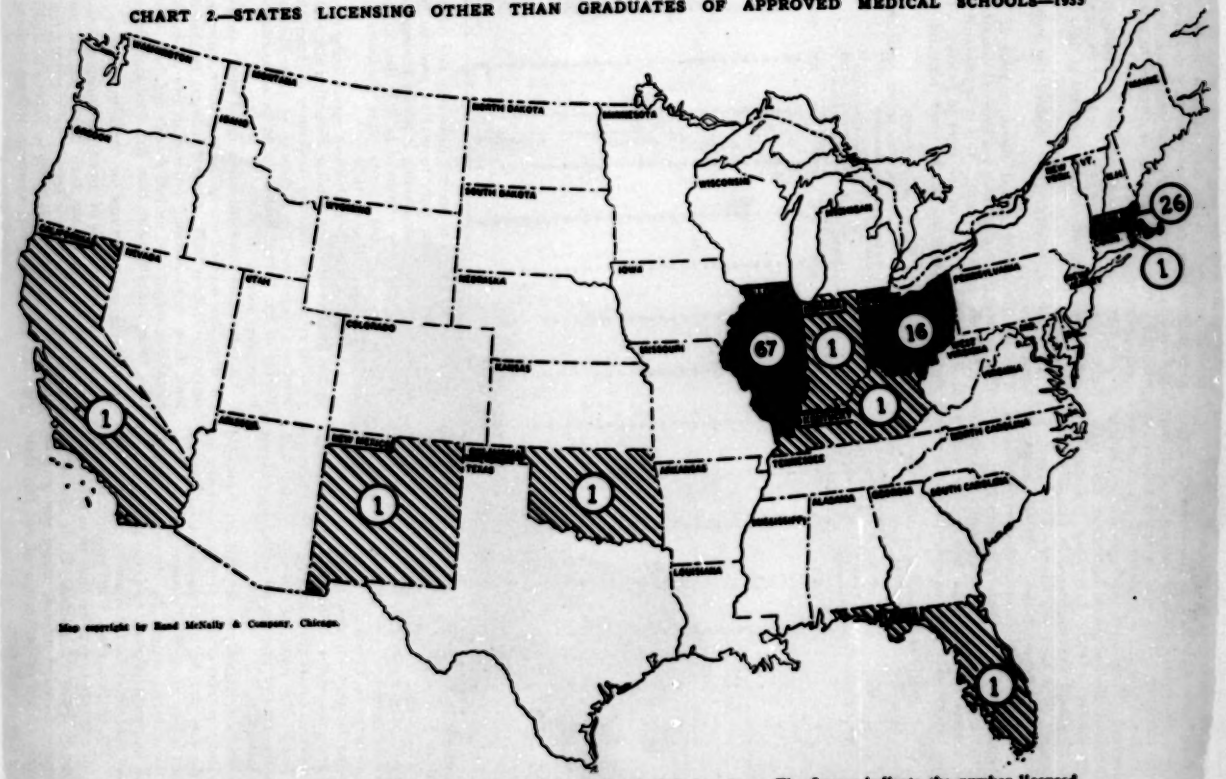
Two charts are presented herewith. Chart 1 shows the states that licensed osteopaths to practice medicine, surgery or both in 1935. Chart 2 indicates by shaded lines those states licensing fewer than five graduates of existing unapproved medical schools and, by a solid area, those licensing more than five such candidates.

GRADUATES OF FACULTIES OF MEDICINE ABROAD

A study of the number of Americans pursuing medical courses in Europe has been carried on by the Council since 1931, when it became evident that great numbers of Americans were going to Europe to study. There are now about 1,500 American students studying

(Continued on page 1492)

CHART 2.—STATES LICENSING OTHER THAN GRADUATES OF APPROVED MEDICAL SCHOOLS—1935



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The states in black licensed more than 5 such candidates, those shaded, 5 or less. The figures indicate the number licensed.

V 106
1936

TABLE 12.—*Graduates of Medical Faculties of Universities in Countries Other than the United States and Canada Examined by Licensing Boards of the United States and Possessions, 1930-1935, Inclusive*

	1930-1934* Inclusive		1935	
	Number Examined	Percentage Failed	Number Examined	Percentage Failed
AUSTRALIA				
University of Adelaide	1	0.0	0	0.0
University of Melbourne	1	0.0	0	0.0
AUSTRIA				
Karl-Franzens-Universität, Graz	18	55.6	5	60.0
Leopold-Franzens-Universität, Innsbruck	4	25.0	0	0.0
Universität Wien	70	31.4	22	31.2
BELGIUM				
Université Catholique de Louvain	6	50.0	3	33.3
Université de Liège	1	100.0	1	100.0
Université Libre de Bruxelles	1	0.0	0	0.0
CHILE				
Universidad de Chile, Santiago	0	0.0	1	0.0
CHINA				
National College of Medicine of Shanghai	1	0.0	0	0.0
Pennsylvania Medical School, Shanghai	2	0.0	0	0.0
University of Hongkong	1	0.0	0	0.0
COLOMBIA				
Universidad de Cartagena	1	0.0	0	0.0
CUBA				
Universidad de la Habana	21	33.3	2	0.0
CZECHOSLOVAKIA				
Deutsche Universität, Prag	20	55.0	1	0.0
Masarykova Universita, Brno	4	100.0	1	100.0
Universita Karlova, Praha	7	28.6	0	0.0
Univerzita Komenského, Bratislava	3	66.7	1	100.0
DOMINICAN REPUBLIC				
Universidad de Santo Domingo	4	25.0	0	0.0
ENGLAND				
Licentiate in Medicine, Surgery and Midwifery of the Apothecaries' Society of London	0	0.0	1	100.0
Licentiate of the Royal College of Physicians of London and Member of the Royal College of Physicians of London	0	0.0	1	100.0
Licentiate of the Royal College of Physicians of London and Member of the Royal College of Surgeons of England	22	4.4	15	0.0
University of Bristol	0	0.0	1	0.0
University of Liverpool	1	0.0	0	0.0
University of London	3	0.0	2	100.0
University of Oxford	1	0.0	0	0.0
University of Sheffield	2	50.0	1	0.0
ESTONIA				
Université de Tartu	1	0.0	0	0.0
FRANCE				
Université de Bordeaux	5	60.0	0	0.0
Université de Lyon	2	0.0	0	0.0
Université de Montpellier	2	50.0	0	0.0
Université de Paris	26	30.8	17	41.2
Université de Strasbourg	2	50.0	3	33.3
Université de Toulouse	1	0.0	2	50.0
GERMANY				
Albert-Ludwigs-Universität, Freiburg	14	35.7	8	37.5
Albertus-Universität, Königsberg	3	33.3	2	50.0
Christian-Albrechts-Universität, Kiel	1	0.0	0	0.0
Eberhard-Karls-Universität, Tübingen	1	0.0	0	0.0
Friedrich-Alexanders-Universität, Erlangen	4	75.0	1	100.0
Friedrich-Wilhelms-Universität, Berlin	45	51.1	39	28.2
Hamburgische Universität	4	25.0	13	23.1
Hessische Ludwigs-Universität, Giessen	1	0.0	2	0.0
Johann Wolfgang Goethe-Universität, Frankfurt-am-Main	7	42.9	10	50.0
Julius-Maximilians-Universität, Würzburg	11	63.6	5	40.0
Ludwig-Maximilians-Universität, München	14	14.3	7	42.9
Medizinische Akademie Düsseldorf	0	0.0	1	100.0
Rheinische Friedrich-Wilhelms-Universität, Bonn	0	0.0	2	0.0
Schlesische Friedrich-Wilhelms-Universität, Breslau	14	50.0	9	22.2
Thüringische Landesuniversität, Jena	5	80.0	0	0.0
Universität Greifswald	3	33.3	0	0.0
Universität Heidelberg	10	50.0	5	0.0
Universität Köln	3	66.7	7	28.6
Universität Leipzig	8	62.5	5	20.0
Vereinigten Friedrichs-Universität, Halle-Wittenberg	0	0.0	1	0.0
Westfälische Wilhelms-Universität, Münster	1	100.0	1	100.0
GREECE				
National University of Athens	13	76.9	1	100.0
GUATEMALA				
Universidad Nacional de Guatemala	0	0.0	1	100.0
HUNGARY				
Magyar Királyi Erzsébet Tudományegyetem, Pecs	9	55.6	0	0.0
Magyar Királyi Ferencz József Tudományegyetem, Szeged	1	100.0	2	0.0
Magyar Királyi Pázmány Péter Tudományegyetem, Budapest	23	26.1	9	11.1
IRELAND				
Licentiate of the Royal College of Physicians of Ireland and of the Royal College of Surgeons in Ireland	2	0.0	2	0.0
National University of Ireland	15	13.3	1	100.0
Queen's University, Belfast	4	25.0	0	0.0
University of Dublin	2	50.0	0	0.0
ITALY				
Regia Università di Benito Mussolini, Bari	1	100.0	0	0.0
Regia Università di Bologna	14	50.0	9	44.4
Regia Università di Catania	3	66.7	0	0.0
ITALY—Continued				
Regia Università di Firenze	9	44.4	0	0.0
Regia Università di Genova	7	71.4	0	0.0
Regia Università di Milano	1	0.0	0	0.0
Regia Università di Modena	5	80.0	2	100.0
Regia Università di Napoli	118	65.3	16	50.0
Regia Università di Padova	8	62.5	4	50.0
Regia Università di Palermo	20	75.5	4	100.0
Regia Università di Parma	3	66.7	0	0.0
Regia Università di Pisa	1	0.0	0	0.0
Regia Università di Roma	56	51.9	27	54.0
Regia Università di Siena	2	50.0	1	0.0
Regia Università di Torino	2	0.0	0	0.0
JAPAN				
Keio Gijuku University, Tokyo	2	50.0	0	0.0
Severance Union Medical College, Keijo	1	100.0	1	100.0
Tohoku Imperial University, Sendai	4	75.0	0	0.0
Tokyo Charity Association Medical College	5	60.0	0	0.0
Tokyo Special Medical School	1	100.0	0	0.0
Tokyo Women's Special Medical School	1	100.0	0	0.0
MEXICO				
Escuela de Medicina de Nuevo León, Monterrey	1	0.0	0	0.0
Escuela Libre de Homeopatia del Estado de Puebla	1	100.0	0	0.0
Escuela Médico Militar, México, D.F.	1	0.0	0	0.0
Instituto Literario y Científico, San Luis Potosí	0	0.0	1	100.0
Universidad de Guadalajara	0	0.0	0	0.0
Universidad Nacional, México, D.F.	9	0.0	3	0.0
NETHERLANDS				
Rijks-Universiteit te Leiden	1	0.0	1	0.0
Universiteit van Amsterdam	2	50.0	1	0.0
NORWAY				
Kongelige Frederiks Universitet, Oslo	3	0.0	0	0.0
PERSIA				
Government Medical School, Teheran	1	100.0	0	0.0
POLAND				
Uniwersytet Jana Kazimierza, Lwów	4	50.0	0	0.0
Uniwersytet Stefana Batorego, Wilno	1	0.0	0	0.0
Uniwersytet Warszawski	0	0.0	1	0.0
PORTUGAL				
Universidade de Lisboa	5	40.0	2	50.0
Universidade do Porto	6	50.0	0	0.0
RUMANIA				
Universitatea din Bucuresti	2	50.0	0	0.0
Universitatea Regele Ferdinand I din Cluj	8	75.0	2	50.0
SCOTLAND				
Licentiate of the Royal College of Physicians of Edinburgh	0	0.0	1	0.0
Licentiate of the Royal College of Physicians and of the Royal College of Surgeons, Edinburgh	2	0.0	3	0.0
Licentiate of the Royal College of Physicians, of the Royal College of Surgeons, Edinburgh, and of the Royal Faculty of Physicians and Surgeons, Glasgow	18	38.9	18	11.1
School of Medicine of the Royal Colleges, Edinburgh	3	0.0	2	0.0
University of Aberdeen	11	27.2	2	50.0
University of Edinburgh	57	8.8	14	7.1
University of Glasgow	6	0.0	12	0.0
University of St. Andrews	52	15.4	22	4.5
SOUTH AFRICA, UNION OF				
University of Cape Town	0	0.0	1	0.0
SPAIN				
Universidad Central de España, Madrid	7	14.3	1	100.0
Universidad de Barcelona	1	0.0	0	0.0
Universidad de Sevilla	1	0.0	0	0.0
SWEDEN				
Kungl. Universitetet i Uppsala	1	0.0	0	0.0
SWITZERLAND				
Universität Basel	1	0.0	2	50.0
Universität Bern	14	57.1	16	37.5
Universität Zürich	4	25.0	6	50.0
Université de Genève	12	58.3	10	30.0
Université de Lausanne	1	0.0	2	0.0
SYRIA				
American University of Beirut	7	14.3	0	0.0
Université de St. Joseph, Beyrouth	3	100.0	1	0.0
TAIWAN				
Taihoku Special Medical School	2	50.0	0	0.0
TURKEY				
University of Istanbul	1	100.0	0	0.0
UNION OF SOCIALIST SOVIET REPUBLICS				
Dnepropetrovsk Medical Institute	1	100.0	0	0.0
First Leningrad Medical Institute	3	66.7	0	0.0
First Moscow Medical Institute	7	71.4	0	0.0
Irkutsk Medical Institute	1	0.0	0	0.0
Kharkov Medical Institute	8	50.0	2	50.0
Kiev Medical Institute	4	25.0	2	50.0
Odessa Medical Institute	1	0.0	0	0.0
Psycho-Neurological Institute, Petrograd	2	100.0	0	0.0
Saratov Medical Institute	4	100.0	2	50.0
Tomsk Medical Institute	4	75.0	1	0.0
Voronezh Medical Institute	1	0.0	0	0.0
YUGOSLAVIA				
Beogradskog Universiteta	2	50.0	0	0.0
Zagrebaskog Universiteta	1	0.0	1	0.0

* Corrected figures.

TABLE 13.—*Graduates of Medical Faculties in Countries Other Than the United States and Canada Examined—1935*

Marginal Number		1 California	2 Colorado	3 Connecticut	4 Florida	5 Illinois	6 Indiana	7 Iowa	8 Maine	9 Maryland	10 Massachusetts	11 Michigan	12 Minnesota	13 Missouri	14 Nevada	15 New Jersey	16 New York	17 North Dakota	18 Ohio	19 Oklahoma	20 Pennsylvania	21 Rhode Island	22 Tennessee	23 Texas	24 Utah	25 Vermont	26 Washington	27 West Virginia	28 Wisconsin	29 Alaska	30 Porto Rico	Totals	Examined—Passed	Examined—Failed	Percentage of Failures	No. of Boards Examined by	Marginal Number
		P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F					
	AUSTRIA																																				
1	Karl-Franzens-Universität, Graz										1 1						2 1															3 2	1	33.3	2	1
2	Universität Wien													1 0		1 0	16 10	1 0					3 0									22 3	19	86.3	5	2
	BELGIUM																																				
3	Université Catholique de Louvain										0 1						1 0						1 0									3	2	1	33.3	2	5
4	Université de Liège										0 1																					1	0	1	100.0	1	4
	CHILE																																				
5	Universidad de Chile, Santiago																1 0															1	1	0	0.0	1	5
	CUBA																																				
6	Universidad de la Habana				2 0																											2	2	0	0.0	1	6
	CZECHOSLOVAKIA																																				
7	Deutsche Universität, Prag																1 0															1	1	0	0.0	1	7
8	Masarykova Universita, Brno																0 1															1	0	1	100.0	1	8
9	Univerzita Komenského, Bratislava																0 1															1	0	1	100.0	1	9
	ENGLAND																																				
10	Licentiate in Medicine, Surgery and Midwifery of the Apothecaries' Society of London																0 1															1	0	1	100.0	1	10
11	Licentiate of the Royal College of Physicians of London and Member of the Royal College of Physicians of London																0 1															1	0	1	100.0	1	11
12	Licentiate of the Royal College of Physicians of London and Member of the Royal College of Surgeons of England														1 0	14 0																15	15	0	0.0	2	12
13	University of Bristol														1 0																	1	0	0	0.0	1	13
14	University of London																0 2															2	0	2	100.0	1	14
15	University of Sheffield																1 0															1	1	0	0.0	1	15
	FRANCE																																				
16	Université de Paris																6 0														2 1	17	10	7	41.2	2	16
17	Université de Strasbourg	1 0 1 0										0 1																				3	2	1	33.3	2	17
18	Université de Toulouse																1 1															2	1	1	50.0	1	18
	GERMANY																																				
19	Albert-Ludwigs-Universität, Freiburg	1 0				1 0											2 2				1 0											6	5	3	37.5	4	19
20	Albertus-Universität, Königsberg																1 1															2	1	1	50.0	1	20
21	Friedrich-Alexanders-Universität, Erlangen																0 1															1	0	1	100.0	1	21
22	Friedrich-Wilhelms-Universität, Berlin	4 0				2 1		1 0		0 1	2 2	1 0					11 6		2 0		1 0			0 1				1 0			30	20	11	36.7	11	22
23	Hamburgische Universität	2 0				2 0				0 1		0 1				1 0	5 1															12	10	2	16.7	6	23
24	Hessische Ludwigs-Universität, Giessen																1 0				1 0											2	2	0	0.0	2	24
25	Johann Wolfgang Goethe-Universität, Frankfurt-am-Main	2 1 2 0								0 1							1 2															10	8	2	20.0	4	25
26	Julius-Maximilians-Universität, Würzburg										1 0			0 1			2 1															5	3	2	40.0	2	26
27	Ludwig-Maximilians-Universität, München	1 1		0 1							2 0						1 0															5	4	1	20.0	4	27
28	Medizinische Akademie Düsseldorf																0 1															1	0	1	100.0	1	28
29	Rheinische Friedrich-Wilhelms-Universität, Bonn									1 0						1 0																2	2	0	0.0	2	29
30	Schlesische Friedrich-Wilhelms-Universität, Breslau	2 1												1 0			2 1		1 0													9	7	2	22.2	4	30
31	Universität Heidelberg	2 0				1 0											2 0			1 0	1 0						1 0					8	8	0	0.0	4	31
32	Universität Köln	1 0														1 0	3 1		0 1													7	5	2	28.6	4	32
33	Universität Leipzig	1 0									0 1						2 0				1 0											5	4	1	20.0	4	33
34	Vereinigten Friedrichs-Universität, Halle-Wittenberg	1 0																														1	1	0	0.0	1	34
35	Westfälische Wilhelms-Universität, Münster																0 1															1	0	1	100.0	1	35
	GREECE																																				
36	National University of Athens				0												0 1															1	0	1	100.0	1	36
	GUATEMALA																																				
37	Universidad Nacional de Guatemala										0 1																					1	0	1	100.0	1	37
	HUNGARY																																				
38	Magyar Királyi Ferenc József Tudomány-egyetem, Szeged																2 0															2	2	0	0.0	1	38
39	Magyar Királyi Pázmány Péter-nés Tudomány-egyetem, Budapest	1 0		1 0							1 0		1 0				1 1		1 0		2 0											9	8	1	11.1	7	39

V 106
1936

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(CONTINUED FROM PAGE 1487)

abroad who apparently plan to return to the United States to practice. Graduates of faculties of medicine abroad examined for licensure in 1935 are presented in table 13. These represent both American and foreign born physicians. Seventy-seven medical schools of nineteen European, four Latin American and three countries in Asia were represented. There were 437 examined, of whom 302 passed and 30.9 per cent failed. The following tabulation of the number examined in six years and the percentage failing is of interest:

	Number Examined	Passed	Percentage Failed
1930	167	92	44.9
1931	158	91	42.4
1932	182	96	47.3
1933	200	129	35.5
1934	285	170	40.2
1935	437	302	30.9

In addition to the figures given, a number are periodically licensed in New York without examination—by endorsement of their foreign credentials which are equivalent to licensure in this country. In 1935, sixty-nine were so registered in New York.

The increase in the number examined in 1935 represent mostly the Americans who began the study of medicine in 1930. In 1933 the Federation of State Medical Boards adopted a resolution to the effect that no student matriculating in a European medical school subsequent to the academic year of 1932-1933 will be admitted to any state medical licensing examination who does not present satisfactory evidence of premedical education equivalent to the requirements of the Association of American Medical Colleges and the Council on Medical Education and Hospitals, and graduation from a European medical school after four academic years of attendance, and further submits evidence of having satisfactorily passed the examination to obtain a license to practice medicine in the country in which the medical school from which he is graduated is located. This policy of the federation has been made effective by individual action on the part of the state licensing bodies and the National Board of Medical Examiners and will have its desired effect in the future.

In 1934 the Federation of State Medical Boards passed a resolution recommending to its constituent boards that, until adequate information is available, these boards deny graduates of foreign medical schools admission to the licensure examination. However, such candidates, as has just been mentioned, were examined in thirty states.

Two years ago the governments of many European countries sent representatives to this country to discuss appropriate measures for dealing with students from the United States. By the raising of entrance requirements, reduction in enrolment and careful scrutinizing of credentials, the number studying abroad should be reduced. During 1935, however, graduates of foreign medical schools were examined in thirty states, the greatest number, 243, having been examined in New York, of whom 35 per cent failed. The next highest figure, thirty-two, were examined in Maryland, of whom 50 per cent failed.

In table 12 are assembled figures showing the standing during the six year period 1930-1935 of the graduates of faculties of medicine outside the United States and Canada admitted to licensing examinations in this country. A similar tabulation is presented for the year 1935. One hundred and thirty schools and eight of the licensing corporations of Great Britain were represented. During the five year period (1930-1934) 1,012 were examined and 437 in 1935. The largest number examined represented the Regia Università di Napoli, 118, of whom 65.3 per cent failed, the Universität Wien in the five year period was second, seventy, of whom 31.4 per cent failed, while there were fifty-seven from the University of Edinburgh, with 8.8 per cent of failures. A study of the percentage failed is of interest. Here again an attempt has been made to show procedure over a period of years, and if an individual fails or is examined in various states he is recorded as such for a given year.

BASIC SCIENCE BOARDS

A certificate in the basic sciences is one of the prerequisites for licensure in nine states and the District of Columbia. In the majority of instances this certificate is obtainable after examination. Boards for the certification of candidates functioned during 1935 in Arizona, Arkansas, Connecticut, District of Columbia, Iowa, Minnesota, Nebraska, Oregon, Washington and Wisconsin. The newest addition to this group is that of Iowa, whose basic science board operated for the first time in 1935. Statistics based on the number of candidates certified in 1935, and those who failed to secure this certification, together with the totals for other years, are included in the accompanying tabulations.

In table 1 will be found the subjects in which examinations were conducted in the respective states and the District of Columbia.

TABLE 1.—*Subjects of Examinations*

	Examinations Required in						
	Anatomy	Bacteriology	Chemistry	Diagnosis	Hygiene	Pathology	Physiology
Arizona	+	+	+	..	+	+	+
Arkansas	+	+	+	..	..	+	+
Connecticut	+	..	..	+	+	+	+
District of Columbia	+	+	+	..	..	+	+
Iowa	+	+	+	..	+	+	+
Minnesota	+	+	+	..	+	+	+
Nebraska	+	+	+	..	+	+	+
Oregon	+	..	+	..	+	+	+
Washington	+	..	+	..	+	+	+
Wisconsin	+	..	..	+	..	+	+

In table 2 is given the year in which the basic science law in each state was enacted and figures showing the number in the various groups who were examined, passed and failed, in 1935. There were 956 candidates examined by nine boards. Of this number 882 were doctors of medicine and medical students (referred to hereafter as physicians), forty-seven osteopaths, twelve chiropractors, and for fifteen it was not possible to determine what profession they represented. In applying for a basic science certificate, it is not necessary in several of the states to mention the school of practice, but by checking the biographic records of the American Medical Association it has been possible to determine what profession the majority of the candidates represented. The remainder have been placed in the unclassified group. Of the physicians examined, 13.7 per cent failed, 42.6 per cent of the osteopaths failed, 83.3 per cent of the chiropractors and of those unclassified 73.3 per cent failed. There were 761 physicians who passed, twenty-seven osteopaths, two chiropractors and four unclassified. Minnesota examined the largest number, 228, of whom 29 per cent failed, while Wisconsin examined 161 and had 3.7 per cent failures. The District of Columbia, on the other hand, examined only thirty, of whom 26.7 per cent failed. Nebraska examined 121 and had 24.8 per cent failures.

V 106
1936

Of osteopaths, Minnesota examined the highest number, fifteen, Washington and Wisconsin each examined ten, Connecticut six, Oregon four and Nebraska two. Chiropractors were examined in Washington (seven), Connecticut (two), while one each was examined in Arizona, Minnesota and Wisconsin. Of the total number of applicants examined, 794 passed and 162, 17 per cent, failed.

TABLE 2.—*Applicants Examined—1935*

	Year Examined	Physicians or Medical Students		Osteopaths		Chiropractors		Unclassified		Total Examined	Passed	Failed	Percentage Failed
		P	F	P	F	P	F	P	F				
Arizona	1933	49	1	0	0	0	1	0	2	44	40	4	9.1
Arkansas	1929	47	9	0	0	0	0	0	0	56	47	9	16.1
Connecticut	1925	169	1	6	0	1	1	0	1	179	167	3	2.7
District of Columbia	1929	22	5	0	0	0	0	0	0	29	22	9	29.7
Iowa	1935	0	0	0	0	0	0	0	0	0	0	0	0.0
Minnesota	1927	153	52	6	0	0	1	3	4	223	162	65	29.0
Nebraska	1927	91	29	0	2	0	0	0	0	121	91	30	24.8
Oregon	1933	77	11	4	0	0	0	1	3	96	82	14	14.6
Washington	1927	83	20	4	6	1	0	0	0	110	88	22	20.0
Wisconsin	1925	148	1	7	3	0	1	0	1	161	155	6	3.7
Totals—Examined		862		47		12		15		956			
Totals—Passed		761		27		2		4		...	794		
Totals—Failed		121		20		10		11		...	...	162	
Percentage—Failed		13.7		42.6		83.3		73.3		...	...	...	17.0

The number of certificates granted by examination, reciprocity and endorsement are listed in table 3. A total of 794 certificates were granted after examination, of which 761 were issued to physicians, twenty-seven to osteopaths, two to chiropractors and to four who were unclassified. There were ninety-six candidates certified without examination, by reciprocity or endorsement, consisting of ninety-two physicians and four osteopaths. Minnesota accepted the greatest number without examination, forty-six, all of whom were physicians, while Wisconsin registered twenty-two physicians and four osteopaths.

TABLE 3.—*Certificates Issued by Examination, Reciprocity and Endorsement—1935*

	Examination					Reciprocity and Endorsement					
	Physicians or Med. Students	Osteopaths	Chiropractors	Unclassified	Totals	Physicians	Osteopaths	Chiropractors	Unclassified	Totals	Registered
Arizona	40	0	0	0	40	0	0	0	0	0	40
Arkansas	47	0	0	0	47	9	0	0	0	9	56
Connecticut	160	6	1	0	167	0	0	0	0	0	167
District of Columbia	22	0	0	0	22	0	0	0	0	0	22
Iowa	0	0	0	0	0	1	0	0	0	1	1
Minnesota	153	6	0	3	162	46	0	0	0	46	208
Nebraska	91	0	0	0	91	12	0	0	0	12	103
Oregon	77	4	0	1	82	2	0	0	0	2	84
Washington	83	4	0	0	88	0	0	0	0	0	88
Wisconsin	148	7	0	0	155	22	4	0	0	26	181
Totals	761	27	2	4	794	92	4	0	0	96	890

Table 4 shows the number of candidates examined and certified from 1927 to 1935 inclusive. In 1935, 13.7 per cent of physicians failed, as compared with 55.4 per cent of other practitioners. In 1928, when five boards were functioning, there were 646 physicians examined, of whom sixty, or 9.3 per cent, failed and fifty-nine other practitioners, of whom twenty-eight, or 47.5 per cent, failed. In 1935, 853 physicians and thirty-seven other practitioners were certified. During the nine year period, a total of 5,939 physicians were examined, of whom 11.3 per cent failed, and 595 other practitioners, of whom 51.6 per cent failed. During this period 784 physicians were certified without examination, while only forty-two other practitioners were so registered.

Altogether, 6,384 certificates have been issued by basic science boards since 1927, of which 6,054 were granted to physicians and 330 to other practitioners. From the high percentage of failures in the other practitioner group it seems apparent that the enforcement of basic science laws affects most seriously this group. Examination of the records of a considerable number of states having basic science laws will show that before such laws were enacted the number of other practitioners appearing for examination and licensure was very considerable and was growing.

TABLE 4.—*Total Candidates, 1927-1935*

	Number of Boards	Physicians or Medical Students					Other Practitioners				
		Examination				Endorsement	Examination				Endorsement
		Examined	Passed	Failed	Percentage Failed	Total Certified	Examined	Passed	Failed	Percentage Failed	Total Certified
1927	5	295	270	25	8.5	20	25	18	7	31.9	1
1928	5	646	586	60	9.3	19	59	31	28	47.5	9
1929	7	683	619	58	8.7	75	68	31	35	53.0	9
1930	7	695	608	79	11.5	104	70	30	40	61.5	4
1931	7	698	598	94	13.6	120	107	68	39	53.1	9
1932	7	657	590	67	10.2	90	78	44	34	43.6	12
1933	8	691	567	74	12.3	117	69	30	39	56.0	10
1934	9	815	725	90	11.0	125	51	26	25	49.0	11
1935	10	862	761	121	13.7	92	74	33	41	55.4	4
Totals		5,939	5,270	669	11.3	784	595	284	307	51.6	42

The basic science board seems desirable in states having a multiplicity of examining and licensing boards. The object of these boards has been to provide a means of insuring that all candidates seeking authority to care for sick and injured people shall first possess a reasonable knowledge of the sciences fundamental to the healing art.

NATIONAL BOARD OF MEDICAL EXAMINERS

The National Board of Medical Examiners was organized in 1915 and conducts examinations and awards successful candidates a certificate, which has come to be regarded as an adequate qualification for the practice of medicine. Since 1922 its examination has been given in three parts, parts I and II being written examinations and part III a practical and clinical oral examination. Data are presented in the following paragraphs regarding the examination and the issuance of certificates to the latter group and include tables enumerating the results of examinations in parts I, II and III for each calendar year, excluding duplications, and also of those certified or failing of certification. Figures taken from compilations not reproduced here are also discussed. Similar data have been presented in the State Board Number of THE JOURNAL for eighteen years.

Four examinations were held in parts I and II during 1935, at which 1,264 and 689, respectively, were examined. In part I, 785 passed and 69, 8.1 per cent, failed, while in part II, 620 passed and 69, 10.0 per cent, failed. There were 410 who took incomplete examinations in part I. This examination is arranged for candidates taking part I at the end of their second medical year, who are attending schools the third year curriculum of which includes courses in one or two sub-

jects of part I. The subjects thus postponed may be taken at any examination period after the candidate has completed them in his medical school. Also listed under this heading are those who wish to spend some additional time on one or two subjects. Incomplete examinations were not included when computing percentages, since they represent neither a candidate eligible for certification nor a failure.

Since 1922, a total of 12,943 examinations have been given in part I and 6,634 in part II. From 1922 to 1935 inclusive, 8,302 individuals have been successful in passing part I, and 5,915 in passing part II. These figures include 3,293 who took incomplete examinations in part I and thirty-three in part II. The figures cover the totals of each examination given during a calendar year and include some who fail and are reexamined during the same year and also some who pass parts I and II in the same year. Therefore they represent examinations conducted rather than individuals examined. In the fourteen year period since 1922 there were 1,348 failures in part I, 14.0 per cent, and 686 in part II, 10.4 per cent.

The results of examinations in part III for the fourteen year period 1922 to 1935 inclusive are presented in table 1. In 1935, 598 were examined, as compared with twenty-eight in 1922. There has been a steady

Table 1.—*Examinations in Part III*

Examinations of	Total Examined	Passed	Failed	Percentage Failed
1922	28	28	0	0.0
1923	76	75	1	1.3
1924	120	114	6	5.0
1925	217	206	11	5.1
1926	255	243	12	4.7
1927	294	272	22	7.5
1928	323	308	15	4.6
1929	351	336	15	4.3
1930	419	400	19	4.5
1931	437	419	18	4.1
1932	549	521	28	5.1
1933	532	507	25	4.5
1934	581	548	33	5.7
1935	598	578	20	3.3
Totals	4,780	4,573	226	4.7

increase of approximately fifty each year since 1925. Of the number examined in 1935, twenty, or 3.3 per cent, failed. The highest percentage of failures was in 1927, when 294 were examined and twenty-two, 7.5 per cent, failed. During 1935, 578 were granted certificates. In fourteen years, 4,799 were examined, of whom 4,573 were granted certificates and 226, 4.7 per cent, failed. Here again a candidate having failed may subsequently receive a certificate. Incomplete examinations were taken for diverse reasons in 1935 by forty-eight candidates. No mention is made of these in the statistics.

From 1915, when the board was organized, up to and including 1935, 4,840 certificates have been granted.

The figures in table 2 represent the number of individuals examined during any one year. The classification as passed or failed, in cases in which more than one examination has been taken in a given year, was based on the results of the last examination during the year in question. For example, if in 1935 a candidate passed part I but later failed part II, he is listed as having failed. Taking this into consideration, there were 2,367 who took the examination of the National Board of Medical Examiners during 1935, as compared with 525 in 1922. A total of 17,370 passed one or more of the examinations in the fourteen years shown and 2,008, or 10.4 per cent, failed. Incomplete examinations have been taken by 3,137 individuals, many of whom have since received certificates.

Diplomates licensed on the basis of their credentials in the United States have increased from two in 1917 to 442 in 1935, 3,021 having been so licensed since the National Board was created. A total of 4,840, however, have received the certificate of the National Board. In 1935, 442 diplomates were registered on the basis of credentials in thirty-nine states and two territories.

The certificate of the National Board of Medical Examiners is granted recognition by the licensing boards of the following forty-three states and four territories:

Alabama	Illinois	Nebraska	Puerto Rico
Alaska	Indiana	Nevada	Rhode Island
Arizona	Iowa	New Hampshire	South Carolina
Arkansas	Kansas	New Jersey	South Dakota
California	Kentucky	New Mexico	Tennessee
Canal Zone	Maine	New York	Utah
Colorado	Maryland	North Carolina	Vermont
Connecticut	Massachusetts	North Dakota	Virginia
Delaware	Minnesota	Ohio	Washington
Georgia	Mississippi	Oklahoma	West Virginia
Hawaii	Missouri	Oregon	Wyoming
Idaho	Montana	Pennsylvania	

Some of these boards, however, have additional requirements.

Diplomates of the National Board of Medical Examiners are admitted to the final examination given by the Conjoint Examining Boards of England and Ireland and the Triple Qualification Board of Scotland. The certificate is also recognized in South Africa, Spain, Syria and Turkey.

Five medical schools now require their students to pass either part I of the National Board examination or parts I and II. Several other schools give their students the option of taking the National Board examination or the school's comprehensive examination. In one or two schools, passing the board's examination in part I excuses the candidate from a portion of the final comprehensive examination given at the end of the fourth year.

Because many graduates of European universities and medical schools are applying for internships in this country, the Council on Medical Education and Hospitals at a meeting in February voted "that when suitable graduates of class A schools of the United States and Canada are not available, hospitals approved

Table 2.—*Parts I, II and III, Excluding Duplications*

	Total Examined	Passed	Incomplete	Failed	Percentage Failed
1922	525	501	52	48	10.4
1923	775	694	79	102	14.7
1924	970	756	69	152	16.8
1925	1,167	915	39	202	18.1
1926	1,161	920	105	136	11.9
1927	1,248	947	142	159	14.4
1928	1,420	1,301	211	108	9.7
1929	1,721	1,500	319	124	8.9
1930	2,044	1,747	322	175	10.5
1931	2,210	1,982	410	178	9.7
1932	2,241	1,949	255	127	6.9
1933	2,277	1,998	260	101	5.6
1934	2,281	1,962	329	130	6.7
1935	2,367	1,830	608	129	6.6
	22,515	17,370	3,137	2,008	10.4

for intern training may accept graduates of European schools who have passed parts I and II of the examinations of the National Board of Medical Examiners."

Examinations in parts I and II are held at class A medical schools in any center where there are five or more candidates available, and part III is held in twenty-two established centers throughout the United States.

V 106
1936

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, APRIL 25, 1936

THE STATE BOARD STATISTICS

The annual report on the examination and licensure of physicians in the United States for the year 1935 appears in this issue. The statistical tables and the special summaries show conditions at present and indicate trends over many years. In 1935, 7,887 applicants were licensed; of these, 5,707 were licensed by examination and 2,180 by endorsement of credentials; 5,509 licentiates were added to the medical profession and some 4,000 died. The net gain was about 1,500.

Failures to pass examination seem to be increasing. In the past five years the total number of physicians examined per year has risen from 5,608 to 6,426. The number of failures rose from 348, or 6.2 per cent, to 585, or 9.1 per cent. The number that failed to pass in 1935 was larger than in any year since 1925.

The graduates of unapproved medical schools of recent and previous years were granted examination in several states, conspicuous among which were Illinois, which registered sixty-seven such graduates, Massachusetts twenty-six, and Ohio sixteen.

The requirement of a hospital internship by state boards began in 1914. At the present time nineteen boards have such a requirement. Because many graduates of European universities and medical schools are applying for internships in this country, the Council on Medical Education and Hospitals at a meeting in February voted that "when suitable graduates of class A schools of the United States and Canada are not available, hospitals approved for intern training may accept graduates of European schools who have passed parts I and II of the examinations of the National Board of Medical Examiners."

The number of physicians granted licenses to practice medicine and surgery without examination in the states and territories was 2,165. These persons presented to the various licensing boards licenses from other states and foreign countries, or the certificate of one of the government services or the National Board of Medical Examiners or other credentials. Florida, Massachusetts and Rhode Island do not have reciprocal or endorsement relations with any state.

GRANULOCYTOPENIA, MALIGNANT NEUTROPENIA OR AGRANULOCYTOSIS

In 1922 Schultz[1] described a condition of the hematopoietic system characterized by severe leukopenia and the disappearance of granulocytes from the peripheral blood. This was accompanied by a necrotic process of mucous surfaces, principally of the mouth and pharynx, profound sepsis, and death in from two to seven days. The onset of the disease is sudden, with prostration and a rapid rise in temperature, which persists throughout the course. Redness and swelling of the pharyngeal mucous membrane is rapidly followed by deep ulcerations, which are covered with a dirty gray membrane. Only a moderate enlargement of the regional lymph nodes is associated. Examination of the blood reveals characteristic alterations in the leukocytes. Leukopenia and granulocytopenia progress in many cases to a total disappearance of granulocytes from the peripheral blood. The total number of lymphocytes and monocytes may remain normal, be increased or, more often, diminish because of the general diminution in the number of the white cells. Their percentage relationship, however, is always increased at the expense of the disappearing granulocytes. The bone marrow as obtained by puncture or at postmortem is pale. In histologic preparations of the marrow, diminution of morphologic elements is observed with a diminution or total absence of granulopoiesis. The surviving cells belong to the lymphoid type. The megakaryocytes and the erythropoietic cells appear normal. Postmortem studies likewise reveal numerous bacterial emboli obstructing the blood vessels, necrotic processes of the mucous surfaces of the mouth, pharynx, gastro-intestinal tract, liver and spleen, and the absence of suppurative processes. The pathologic alterations described are believed to be due to failing or arrested granulopoietic function of the bone marrow.

This disease has occurred with greatest frequency in the United States and in Germany, where it was first described. It has been seen predominantly in women (from 80 to 90 per cent) of middle age of the better social status and shows a peculiar predilection for members of the medical group.

Three hypotheses were promptly advanced as to the etiology of this condition. The first considered sepsis as the primary cause and the blood changes and the necrotic lesions of mucous membranes as secondary. The second hypothesis considered the characteristic lesions of the mouth and the pharynx the primary lesion, giving rise to sepsis and granulopoietic disturbances. The third hypothesis considered the alterations in the granulopoietic organs the primary and essential cause, and the septic state and the necrotic lesions as the result of loss of the defense mechanism in an organ deprived of its granulocytes. The last hypothesis has been accepted by most investigators,

1. Schultz, Werner: Ueber eigenartige Halserkrankungen, Deutsche med. Wchnschr. 48:1495 (Nov. 3) 1922.

although the nature of the depressing agent remained largely undetermined. Bacteriologic studies, as well as animal injection experiments, failed to demonstrate a specific organism. Various investigators were able to produce agranulocytic changes followed by sepsis, by administration of toxic substances such as benzene,[2] neoarsphenamine,[3] bismuth compounds and gold preparations. Kracke and Parker[4] collected from the literature reports of 173 cases of agranulocytosis following the ingestion of drugs. Of this group, 153 cases followed the use of aminopyrine. According to these authors, four salts can be incriminated as etiologic factors. These, in the order of their importance, are aminopyrine, dinitrophenol, gold salts and organic arsenic compounds. Endocrine influences and constitutional predisposition, as well as a true allergic response, were advanced to explain why a relatively small number of persons, in view of the wide use of aminopyrine, should react to this drug with damage to the hematopoietic system. The exact mechanism of drug action requires further elucidation.

Since Schultz first described the disease, our concept of it has undergone a number of modifications. The occurrence of symptomatic agranulocytosis, due to a definite cause in each case, suggests that the condition is possibly not an independent clinical entity but a syndrome. In addition to the type in which leukopoiesis alone was disturbed, there were observed types in which there existed a combination of disturbances of leukopoiesis with that of disturbance of erythropoiesis or thrombopoiesis. Types were observed in which granulocytopenia was combined with a grave anemia of the aplastic type, types combined with thrombocytopenia and hemorrhagic diathesis, and, finally, a form of hemorrhagic aleukemia described by Frank in 1925. Many cases exhibit a slow development as well as recurrences. Furthermore, a number of patients have recovered, although the prognosis, especially of the essential variety, remains grave (mortality of about 92 per cent). A favorable prognosis can be predicated on the appearance of eosinophils in the blood, a progressive increase of leukocytes and, in particular, on the appearance of granulocytes of various degrees of maturity, of myelocytes and of myeloblasts.

The therapy of the disease is far from satisfactory. Pentnucleotide was introduced in 1929 in the hope that it would stimulate leukocytosis. Jackson[5] believed it to be efficient when given in large enough doses, not less than 40 cc. daily. Kracke and Parker did not see any benefit from it. Parenteral administration of liver extracts has favorably influenced the course of the disease, according to recent reports. It is questionable whether transfusion of blood will have a stimulating effect on leukopoiesis. At the present state of our knowledge it would appear wise to combine all the experimental therapeutic agencies that have been mentioned.

2. Kracke, R. R.: The Experimental Production of Agranulocytosis, Am. J. Clin. Path. 9:11 (Jan.) 1932.
3. Kliiver, W.: Appearance of Agranulocytic Symptom Complex as Result of Antisyphilitic Treatment with Arsphenamines and Bismuth, Dermat. Wchnschr. 101:1118 (Sept. 14) 1935.
4. Kracke, R. R., and Parker, F. P.: The Relationship of Drug Therapy to Agranulocytosis, J. A. M. A. 105:960 (Sept. 21) 1935.
5. Jackson, Henry J.: Agranulocytosis, Ann. Int. Med. 9:26 (July) 1935.

CHEMISTRY OF VITAMIN E

One by one the physiologically important natural constituents of plant and animal material are yielding their chemical identities to the exhaustive researches of the organic chemist. The preparation in pure form and the identification as a chemical entity of any substance of physiologic significance in the organism has invariably been followed by rapid accumulation of information suggesting its functions in the body. It is only necessary to recall the more recent investigations on cevitamic acid, or vitamin C, as an illustration of this point.

All the well established vitamins, and some of the less definite suggested food accessory factors, have received attention from the chemist. The efforts in some cases have led to the isolation of crystalline substances capable of producing physiologic responses known to be characteristic for the particular vitamin and therefore supporting the conclusion that the isolated material is identical with the vitamin itself. In several instances, for example in the case of vitamins A, B_1, B_2 (G), C and D, the organic chemist has established, with a considerable degree of certainty, the chemical formulas and structures of the particular vitamin. Relatively less attention has been given by the chemist to vitamin E, the food accessory substance essential to the rat for the normal bearing of the young. However, three laboratories—Evans and his collaborators at the University of California, Olcott and Mattill at the University of Iowa, and Drummond and his group at University College, London—have expended considerable effort in attempts to concentrate, isolate and identify vitamin E. The goal appears to be near at hand.

In a recent communication[1] the California group reports the successful isolation from wheat germ oil of an alcohol having the properties of vitamin E. The material was obtained as an oil, and it exhibited sporadic vitamin E activity in doses of 1 mg. A single dose of 3 mg. permitted the regular production of normal litters under nutritive conditions not ordinarily favoring normal gestation. The investigators propose for this alcohol the name "α-tocopherol," from the roots "tokos" meaning childbirth, "phero" to bear and the ending "ol," indicating an alcohol. Two crystalline derivatives of this physiologically active oil were prepared, and the elemental analyses of these compounds indicate an empirical formula of $C_{29}H_{50}O_2$ for the vitamin itself. Two additional alcohols were also obtained as oils from the wheat germ concentrate, each of which proved to be isomeric with α-tocopherol. One

1. Evans, H. M.; Emerson, O. H., and Emerson, G. A.: J. Biol. Chem. 113:319 (Feb.) 1936.

V 106
1936

was physiologically inactive, the other appeared to have some vitamin E potency. The isolation of the vitamin itself in crystalline form and establishment of its chemical configuration should give some interesting insight to its rôle in the organism and to the mechanism of its activity.

MEDICAL PROGRESS IN THE PHILIPPINES

In 1935 there were in the Philippines a total of 2,901 physicians for an estimated population of about 13,500,000. There was therefore one physician for every 4,700 inhabitants, or about twenty-one physicians per hundred thousand of the population. This compares with 126.6 physicians per hundred thousand of the population in the continental United States. A review of the past and present medical services in the Philippine Islands has recently appeared under the auspices of the local medical society.[1] Medical services are rendered by the Philippine government, private practitioners, private corporations, semigovernmental institutions and the United States government.

One way of measuring the efficiency of medical services is comparison of the mortality rates. This is a crude method and subject to numerous modifying factors, but it does give information. For many years there has been a steady decline in the mortality rates in the islands. From a rate of 39.7 during the Spanish régime it shot up to 50 from 1899 to 1903 and came down to 27.05 in 1904. Since 1904 there has been a gradual decline, except for 1918, and since 1921 it has been below 20 per thousand. This rate compares with a rate of 14.7 for the United States, 40 for China and 28 for Spain. It is still higher than the rate of the Anglo-Saxon countries, but, with the exception of Japan, the lowest of the oriental. It is also lower than the rates of Puerto Rico, Spain and Mexico.

Part of the high death rate has been due to infant mortality, largely infantile beriberi. The effectiveness of the campaign to reduce infant mortality is illustrated by the decrease in the infant death rate from 225 per thousand in 1904 to 146 per thousand in 1933.

Another important fact brought out by this report is the large share of credit due the private practitioners for the improved conditions. Of the 2,901 medical practitioners in the Philippines only about 745 are in the service of the Philippine government and about sixty-eight in the service of the United States government. There has been a considerable increase in the number of medical men in the Philippines, so that the average age of the physicians is relatively low (38) and a high percentage are still, therefore, in the prime of life. While this is an advantageous factor, the report clearly shows that there is room for still further increase in the number of physicians and especially for their better distribution. The number of hospitals also has increased from seventy in 1924 to 147 in 1934.

Fernando, who wrote the report, also points out that the remarkable improvement in health attained during the American régime in the Philippines has occurred with a high degree of cooperation between private practitioners and governmental agencies and that neither compulsory health insurance nor complete government practice of medicine has at any time been necessary. There seems to be no question that this improvement will continue, if judged by the constructive recommendations embodied in the report. The time-tested methods of medical progress are clearly shown not to have outworn their usefulness.

1. Fernando, A. S.: Medical Service in the Philippines, J. Philippine Islands M. A. 15:637 (Dec.) 1935.

Current Comment

FATE OF INJECTED ALUMINUM

The widespread modern use of cooking utensils made of aluminum has attracted interest in the question of the behavior of this metal in the animal body. As was stated in these columns a short time ago,[1] there is no convincing evidence that aluminum in amounts in which it is likely to be consumed as a result of the use of aluminum cooking vessels has a harmful effect on the ordinary consumer; indeed, there is no definite proof of the absorption of this metallic element from the gastro-intestinal tract. However, that a small amount of aluminum gains entrance into the normal animal organism is indicated by the general finding of minute quantities of the element in various tissues. Questions logically arise regarding the fate of aluminum once it enters the animal body. If it is largely excreted, what is the pathway? If it is stored, what effects may result from its presence? A number of investigations in which soluble aluminum salts have been injected into animals and subsequent analyses made of the tissues and excreta have been performed in order to answer these questions. In the most recent study of this type[2] a small amount of aluminum, as the chloride, was injected intravenously into dogs for long periods. Analyses of the tissues of these animals demonstrated that a small amount of the injected aluminum was stored, chiefly in the liver and spleen, and to a lesser extent in the kidney. Traces of the metal were present in various other tissues. Apparently most of the substance was promptly excreted in the urine and in the bile. No definite statement concerning toxic reactions in the experimental subjects was made. In another species, the rabbit, the continued intravenous injection of small amounts of aluminum was found to produce a profound anemia and pathologic changes in the kidneys and spleen.[3] Thus far a great mass of available evidence attaches little significance to small amounts of aluminum entering the human body by ingestion.

1. Aluminum in Food, Current Comment, J. A. M. A. 106:218 (Jan. 18) 1936.
2. Eveleth, D. F., and Myers, V. C.: Studies on Aluminum: II. The Storage of Intravenously Injected Aluminum in the Dog, J. Biol. Chem. 112:467 (March) 1936.
3. Seibert, F. B., and Wells, H. G.: The Effect of Aluminum on Mammalian Blood and Tissues, Arch. Path. 8:230 (Aug.) 1929.

Association News

THE KANSAS CITY SESSION

Alumni Dinners

Alumni dinners, in addition to those listed in the Kansas City Number of The Journal, have been arranged as follows:

University of Minnesota Medical School, Wednesday evening, May 13, Parlors A and B, Fourth Floor, Kansas City Club, E. H. Trowbridge, chairman.

Tulane University of Louisiana School of Medicine, Wednesday May 13, 6:30 p. m., Florentine Room, Kansas City Club, Evan S. Connell, chairman.

Special Train Service to Kansas City

The Chicago, Milwaukee, St. Paul and Pacific Railroad announces that the "Southwest Limited," a de luxe, air conditioned train, will leave Chicago from the Union Station daily beginning Sunday, May 10, at 7:30 p. m., arriving in Kansas City at 8 a. m. This train will carry special sleeping cars for the use of members of the American Medical Association attending the annual session at Kansas City. For reservations please communicate with Mr. V. L. Hitzfeld, Assistant General Agent, Room 711, 100 West Monroe Street, Chicago.

Association of Military Surgeons of the United States

The Association of Military Surgeons of the United States will have a dinner in the Francis I Room of the Hotel Baltimore on Tuesday, May 12. The speakers at the dinner will be General Robert U. Patterson and Colonel Kent Nelson.

American Board of Dermatology and Syphilology

A dinner for the diplomates of the American Board of Dermatology and Syphilology has been arranged for at the Hotel Kansas Citian on Wednesday, May 13, at 7 p. m. Diplomates who have not made reservations are requested to notify at once Dr. Charles C. Dennie, 1524 Professional Building, Kansas City, Mo.

BROADCASTS FROM THE KANSAS CITY SESSION

Special radio programs will be broadcast from Kansas City during the week of the annual session.

NATIONAL BROADCASTING COMPANY

The following programs will be delivered over a network of the National Broadcasting Company:

May 11, 4:30 p. m.: "Nutrition and the Future of Man," by Dr. James S. McLester, President of the American Medical Association. Fifteen minutes.

May 12, 4 p. m.: Medicine Marching Forward. The regular dramatized program "Your Health" (originating in Chicago), based on papers or exhibits presented at the convention. Thirty minutes.

May 13, 12 noon: An interview about the Scientific Exhibit with Dr. Morris Fishbein. Fifteen minutes.

COLUMBIA BROADCASTING SYSTEM

The following programs will be broadcast over a network of the Columbia Broadcasting System:

May 11, 1:30 p. m.: An interview with one or more distinguished foreign visitors by Dr. Morris Fishbein. Subject to be announced. Fifteen minutes.

May 15, 2 p. m.: A news broadcast outlining the main events of the convention. Dr. W. W. Bauer. Fifteen minutes.

May 15, 8:45 p. m.: Medicine Yesterday and Today. A dramatized program (originating in Chicago), based on papers or exhibits presented at the convention. Thirty minutes.

The hour given is central standard time; eastern standard time is one hour later, mountain time one hour earlier, and Pacific time two hours earlier. Daylight saving time in each locality is one hour later.

RADIO BROADCASTS

The American Medical Association broadcasts over WEAF, the Red network instead of the Blue, as formerly, and certain additional stations of the National Broadcasting Company at 5 p. m. eastern standard time (4 o'clock central standard time, 3 o'clock mountain time, 2 o'clock Pacific time; daylight saving time in each locality is one hour later) each Tuesday, presenting a dramatized program with incidental music under the general theme of "Medical Emergencies and How They Are Met." The title of the program is "Your Health." The program is recognizable by a musical salutation through which the voice of the announcer offers the toast "Ladies and gentlemen, your health!" The theme of the program is repeated each week in the opening announcement, which informs the listener that the same medical knowledge and the same doctors that are mobilized for the meeting of grave medical emergencies are available in every community, day and night, for the promotion of the health of the people. Each program will include a brief talk dealing with the central theme of the individual broadcast.

Red Network.—The stations on the Red network of the National Broadcasting Company are WEAF, WEEI, WTIC, WJAR, WTAG, WCSH, KYW, WFBR, WRC, WGY, WBEN, WCAE, WTAM, WWJ, WMAQ, KSD, WHO, WOW, WDAF.

Pacific Network.—The stations on the Pacific network are KGO, KPO, KFI, KGW, KOMO, KHQ, KFSD, KTAR.

Network programs are broadcast locally or omitted at the discretion of the local station. The lists indicate stations to which programs are available.

The next three programs are as follows:

April 28. Infant Care, W. W. Bauer, M.D.
May 5. Maternal Care, W. W. Bauer, M.D.
May 12. Medicine Marching Forward, W. W. Bauer, M.D.

ANNUAL CONGRESS ON MEDICAL EDUCATION, MEDICAL LICENSURE AND HOSPITALS

Dr. Fred Moore, Des Moines, Iowa, in the Chair

COUNCIL ON MEDICAL EDUCATION AND HOSPITALS

Thirty-Second Annual Meeting, held in Chicago, Feb. 17 and 18, 1936

(Continued from page 1397)

FEBRUARY 18—AFTERNOON

Swans Sing Before They Die

Dr. E. P. Lyon, Minneapolis: I shall speak of some of the problems of medical education which I consider important and which I hope the future may solve. The first concerns the choice and admission of students. This involves a responsibility on the part of college officers which they have rarely sufficiently realized and faced. It predicates decisions on which the whole life and work of young men and women may depend, and in which the future standards of medical practice may be foreshadowed. That the job is not well done is manifest by the large proportion of failures. As a basis for this function we have first the record of the premedical scholarship marks. These come to our desks from some 700 colleges, including every type and grade of institution from the standpoint of facilities, staff and curriculum. The same thing is brought out by the Moss aptitude test. The average percental rank attained by those taking the test in some premedical colleges and universities is well above the mean. The average percental rank in some other colleges is markedly below the average for the country as a whole. This may be due in part to differences in teaching and length of training. But most educators are agreed that the prime factor is selection. Out of this comes the fact that the marking systems of different collegiate institutions are not comparable. The great question emerges Can we get any better basis for admission than college grades, intelligence tests and interviews, for such as believe in that technic? At Minnesota an all-university committee has worked on this problem for two years. There is a subcommittee for each school and college. That for the medical school consists of three of our professors, several psychologists, ample statistical and clerical

V 106
1936

help. An industrial process that recorded a 20 or 25 per cent rejection of imperfect parts in the manufacturing process would certainly be regarded as inefficient. If inevitably some of these imperfect parts slipped by the inspection and appeared in the finished product, managers and owners would be troubled. We medical educators should be concerned. Until we are surer about our raw material, more exacting in our inspections, more clear as to what our product should be, the medical profession will average lower than it should in the great field test that goes on day by day in the fight for better health. School examinations need as close scrutiny as our choice of raw materials. We need a new or at least a tested and reliable technic of examination.

What is happening to our material outside college walls? One of the psychologists of our committee, raised the question of medical fraternities in a new way: How is the performance of these groups in medical school in comparison with what it ought to be on the basis of premedical grades. Out of this comes the conclusion, that some fraternities do better and some worse than would have been expected. It is disquieting that we may have organizations among our students which actually have the effect of lowering the potential performance of their members.

Another feature which causes concern is the fact that medical education is in general restricted to those who have money. This fact means inevitably that some superior men cannot enter the medical profession and that the average standard is lowered thereby. The problem is real in every line of education. In a study of high school graduates in Minnesota, Dean J. B. Johnson of the Arts College estimates that there are perhaps 300 superior students a year in the high schools of the state who are unable to attend college because of lack of money. Under our system we can suggest nothing better than scholarships with a well organized arrangement for their distribution to the most able candidates. I firmly believe that at present ten million dollars would at no other point create such dividends of medical progress as in the search for and assistance of submerged superior ability.

In general I am favorable to increased requirements. But before the three year premedical course becomes embedded in the requirements of state boards I advocate that an alternative proposal be experimented with by some medical colleges. I would add another year to the medical course itself. I would transfer to the medical curriculum some of the courses now classed as premedical, such as organic chemistry, sociology and psychology. I would leave the minimum entrance requirement at two years of college as now, but the transfer described would permit of a wider sampling of college offerings in the direction of cultural background. I think the added medical year would enable faculties to plan a better balanced medical curriculum. I would begin anatomy, biochemistry, perhaps bacteriology in this year. But I would devote at least half the time to subjects now considered premedical. Psychology, adapted to medical students and thought of as the basis of mental medicine in the same way as anatomy and physiology are basic to physical medicine, would certainly be required and in the medical curriculum. I suggest that the objection of added expense be met by keeping the fee for this year lower than for the other medical years. I suggest further that limits of attendance be not so rigidly enforced and that this preliminary year be the real testing ground of fitness for continued medical study. Those familiar with the Toronto plan will recognize the similarities. The main argument is to secure for students a year earlier the immense motivation that comes from being a real medical student.

The question of overproduction of doctors is of the greatest importance. I contend that there are already too many doctors, even if they were properly distributed and even if their services were available to all people, neither of which contingencies is true or likely to be true under American conditions. In many years at a dean's desk, I have watched the increasing difficulty and discouragement experienced by young doctors in earning a living. To say that the same condition exists in every profession does not help the situation. Last summer I had a conference with Professor Thunberg at Lund, Sweden. He showed me the letter setting the number of new medical students that may be received this year at the Swedish universities—forty-four at Lund, fifty-six at Uppsala, 100 at Stockholm. "But who," I inquired, "makes the decision?" "The chancellor," replied Dr. Thunberg, "whose name is signed to this letter. We Swedes have confidence in him. He is in touch with all interests, including the medical profession. The accepted principle is to educate only as many doctors as the country needs. The decision of the chancellor is accepted by all." So far as I can see, the American Medical Association has made only a tentative approach to this problem. Let the elder statesmen add to their number such specialists as may be needed, sociologists, educators, population experts. Let them determine the facts. Bring the united wisdom of those interested to bear on the question. I think that the colleges would reduce the number of their medical students if requested to do so by such a commission.

Function of the Hospital in the Training of Interns and Residents

DR. J. A. CURRAN, New York: This article appeared in THE JOURNAL, March 7, page 753.

The Laboratory of Pathology in the Small Hospital

DR. HOWARD T. KARSNER, Cleveland: This article appears in full in this issue, page 1445.

DISCUSSION

DR. A. S. GIORDANO, South Bend, Ind.: Adequate laboratory facilities require ample room space. Requests for examinations, delivery of specimens and delivery of reports are time consuming, so that it is imperative that the clinical laboratory be centrally located. A basement or top floor location thus is expensive as well as inconvenient. Should routine laboratory examinations be delegated to interns instead of supervised technicians? My experience leads me to answer no. A well trained technician will render far superior and more uniformly dependable service. However, since it is necessary that interns acquire practical training in laboratory technic, it is recommended that they be required to do only the routine laboratory work on patients in their care; but the technician should check the results. The third point involves a fundamental principle; namely, that the function of the college is to teach and conduct research. The question is, should teachers of pathology engage in the extracollegiate practice of laboratory medicine? I should like to submit reasons for answering this in the negative. I have the highest regard for the author as a teacher and scientific investigator. The proposed plan, however, would not go far as a universal solution of the problem. This plan has worked satisfactorily in Cleveland, but is not the credit due to Dr. Karsner's personality, integrity and sympathetic understanding of the problem? How few are the localities where all of these circumstances may be duplicated; and if the operation of the plan were not maintained on an exceptionally high plane, abuses would creep in. By the same logic, the medical college should also send their other young teachers in surgery and in medicine to help out in the small hospital. What has happened elsewhere? The teaching staff has deviated from its primary objective and has engaged in what amounts to a mail order house type of practice of pathology. This system has tended to discourage local hospitals from pooling their local resources, thus supporting in their own community a well staffed central laboratory, the personnel of which is available on a moment's notice to render efficient personal service. In my community we have a central laboratory operating branches in each of three smaller hospitals totaling about 250 beds. In addition, we provide laboratory service to the local physicians. The cost to patients compares favorably with that in larger institutions and yet the plan affords a profit to the participating hospitals as well as to the organization that serves them. This plan is applicable on a national scale. It can be made to solve the problem more adequately, since it removes the teaching institution from the sphere of extramural practice. Moreover, it removes from the hospital the temptation to sell to the public a branch of specialized medicine. It gives to the pathologist an independent sphere of operation through which he may develop a true sense of individual responsibility to the patient and a greatly needed service to his colleagues not only by examining the surgical specimens but also by the performance of postmortems, the daily supervision of all the laboratory tests

and above all the interpretation of these tests in the light of the clinical picture. The American Society of Clinical Pathologists, at its annual meeting in Kansas City, will conduct a symposium on this subject. The great need in the problem of laboratory service for the small hospital lies in the development of centralized local units operating in nearby branches and independently of teaching laboratories. The excess energies of the latter may very well be directed toward training the personnel to man these centralized units. It is something to reflect on that the number of teaching pathologists who are prepared to give advanced instruction in pathology is decidedly limited. To bring this point home, we are faced each year with the problem of finding some one whose breadth of knowledge and experience qualifies him to conduct a seminar in cellular pathology.

Dr. Norbert Enzer, Milwaukee: I work as a director in a small hospital. In a laboratory servicing a hospital whose daily average of occupancy is from 100 to 120 patients, we provide a laboratory service covering all types of investigation, with the exception that we do not have available animal facilities. We have a staff of technicians and there is one director. I make this description in order to make significant the statement that the laboratory maintains itself and even does beter. The question that came to mind when I heard Dr. Karsner's presentation was this: He is concerned about servicing the small hospital at a cost not prohibitive to the small hospital. My answer is that, if pathology is practiced as other branches of medicine are practiced, the hospital need not be concerned in the cost of this thing at all. Fees are derived from patients. Patients are charged for everything that is done in a laboratory sense. I would not hesitate to ask the question, then, of these small hospitals who are receiving what I would consider not adequate laboratory direction: What is the revenue received by the hospital from laboratory fees? and also To whom does it go? Pathology is the practice of medicine, and only those licensed to practice medicine can direct laboratories and do such work. Then no one can participate in the benefits of that practice except those who are practicing it, and for those it shall be deemed their judgment as to how it shall be distributed in terms of cost of maintaining those laboratories. If it is accepted that these laboratories are operated on a fee basis, there is hardly a hospital in which the occupancy will run from 100 to 150 patients that cannot afford to have adequate and even progressive laboratory service, under adequate laboratory direction. Now this question of full time: An unfortunate result of that has been that pathologists have been paid and their services evaluated whether or not they gave full time or part time. Not the service was paid for, but the time. That is not in keeping with high professional standards.

Dr. W. D. Forbus, Duke University, N. C.: I think that an inadequate definition of what a small hospital is has been given. I have been faced with the problem during the last three years of working out some solution for a group of hospitals ranging from fifteen to, let us say, sixty-five beds. It seems that the scheme which has been put forth as adequate for what I should call a large hospital might experience some difficulty in being applied to what I know, in my environment, to be a small hospital. Perhaps that will be taken into consideration in further discussion of the problem.

Dr. Howard T. Karsner, Cleveland: The hospital laboratory certainly should be centrally located, and I further agree that the basement is no place for it. Dr. Forbus recognizes that it is impossible to draw a sharp line between what is a large hospital and what is a small hospital. One may say that a hospital of 150 beds, most of which are general beds, is a large hospital. One may say that a hospital of 150 beds, most of which are maternity beds, is a small hospital. While I recognize the fact that there may be limits to this plan, I simply have proposed it as a general principle of operation, to be adopted wherever possible. Dr. Enzer's discussion is of the utmost value as representing a point of view that is different from what is expressed in the paper, in this sense: I have referred to hospitals which, by virtue of various limitations, are unable to have as pathologist a man who will furnish the major part of his time and attention to that hospital. There are hospitals in which it is possible to have as pathologist a competent, well trained man, but in many communities that is not possible, and the problem then is to service that hospital with a part time man. Dr. Enzer refers to the matter of a laboratory supporting itself. I think that in the operation of the first class hospital the objective of the laboratory is to supply service to the hospital. Whether that leads to self support or not is beside the point. That is up to the administrator of the hospital. There is, however, a danger inherent in this sort of thing, and that is the exploitation of the laboratory and the director for the benefit of the general funds of the hospital, a thing which should be decried. Where the centrum happens to be is a matter of relatively small importance; it is who the centrum is that is important, and whether that "who" is a man operating a private laboratory or a man who is in a university laboratory is unconsequential. Certainly the interests of the patient should never be subordinated to the interests of the hospital as a whole. I think the training in the modern medical school gives the graduate a comprehensive view of the place of the clinical laboratory in matters of diagnosis and treatment. I recognize that the house officers need guidance in the performance of the test. That should be provided by the pathologist in the hospital laboratory. To turn over to young graduates the entire responsibility for the clinical laboratory examinations would provide nothing in the way of his education and training. I think his supervision should be in the hands of the pathologist in charge rather than of the technician. This particular matter should be evaluated in the broadest way, giving to the education of the house officers a place of significance and promise not only as regards laboratory work but as regards all the activities of his training. The plan proposed certainly places responsibility on the pathologist who is in charge of the small hospital, but that responsibility is shared by seniors who have greater experience and longer training. Dr. Giordano spoke of the mail order type of business, and we should discourage that. We must recognize, however, that private physicians may at times be aided by a service of this kind, provided it is on a consultation basis, not merely sending in a piece of tissue and a request for diagnoses, whether the place the tissue was taken from, the history of the case, the diagnosis and name of the patient is appended or not. We do nothing of that sort. We must know about the patient. The idea that a student of pathology should be occupied only in teaching and research is subversive to the best interests of pathology and medicine. Pathology in a university is the stepping stone between the so-called preclinical and clinical divisions, more closely allied to the clinical divisions than to the preclinical divisions. As a university subject it represents an intensely practical field. Where it is proper teaching, it should require attention to the clinical aspects, wherever possible. The university department that is actively engaged in doing practical work in pathology serves the educational interests of the students to greater advantage than if it occupies the place of a so-called preclinical science. Granted it should be engaged in research, there are undoubtedly contributions made to investigations which would not take place if the department were divorced from practical work. I do not mean to say that there are not good departments of pathology in our universities which have little association with hospitals. I think, however, that the heads of those departments recognize that they could do better by the students and the staffs if they had close hospital connections than they are able to do without such connections.

Use of the Outpatient Department in Medical Education

Dr. W. McKim Marriott, St. Louis: This article appears in full in this issue, page 1442.

DISCUSSION

Dr. Robert W. Keeton, Chicago: Some of the organization requirements as they apply to the general medical clinic may be summarized: 1. It is obvious that dispensary patients present complex problems and that the opportunities for solving them are smaller than in hospital patients. Hence the clinic should be manned by the most mature students. This means seniors. 2. The dispensary time should furnish the student his opportunity to begin the practice of medicine. He should learn here an approach to the patient and a method of examining him that he will use later in his office. This means that he must be interested in solving this particular patient's prob-

V 106
1936

lems. It is not important for him to be running from one examining room to another looking at interesting cases. This breadth of knowledge is to be obtained elsewhere in the curriculum. 3. Some form of an appointment system for patients must be introduced, so that the student will not be rushed in doing his work and yet will have patients returning to him with regularity. 4. Patients must be assigned to the student and he must be their physician until he transfers them to an attending man. Until the attending man receives the case, he acts solely in a consulting capacity. In the order of their importance, the medical school's responsibilities to medical education are: 1. To provide facilities by which students may study patients independently and assume responsibility for their medical care. 2. To provide an attending staff capable of giving guidance and acting in the capacity of consultants. 3. To provide for sufficient extramedical assistance for the establishment of a service as described by Dr. Marriott, in which preventive medicine will assume a more and more important rôle and to which the former graduates of the school may return for instruction and stimulation. I feel that such a clinic would enable the school to meet satisfactorily the demands for so-called graduate work which up to date have been largely ignored.

DR. JOHN V. LAWRENCE, St. Louis: All of the progress made by outpatient departments during the past few years is integrated in a change of purpose of these departments from dispensaries for the medical relief of symptoms to institutions for complete medical service. On the one side these changes are the result of two converging factors: (1) the enormous increase in medical knowledge and procedures; (2) a changed attitude on the part of the lay public, who now demand the benefits of medical knowledge as their rightful privilege. Complete or adequate medical service to the patient not only fulfils the responsibility of an outpatient department in its respective community but constitutes the irreducible minimum of teaching procedure and example to medical students. The care of the patient today implies a consideration of a cross section of his health picture, which includes the patient's picture as a whole: pathology, psychology, and social and environmental factors of adjustment. New consideration of standards and methods for conducting outpatient departments has been under way during the past few years. Soon a minimum of standards will be recommended for outpatient departments the country over, classified, let us say, and even evaluated standards as to (1) professional excellence of practice in the departments whereby the best medical supervision may be stressed; (2) admission of patients whereby they are controlled and allocated to divisions for the most adequate care; (3) incisive and accurate accounting of costs and statistical analysis of pertinent and guiding data; (4) optimal inclusion of social service in the clinic organization in order to interpret more adequately the patient to the physician and the physician to the patient, thus to formulate the concept of the place of social service for oncoming physicians; (5) controlled conduct of the patient's attendance throughout the clinic and discharge from treatment with appropriate follow-up information and guidance; (6) unified records of the medical care of the patient, whether ambulatory or bedfast. These standards, as well as others, are necessary for the changing era in medical care and teaching. The outpatient department can no longer be considered merely a feeder for hospital wards but takes its place significantly in the march toward preventive medicine as a reality, and adequate medical care of the people.

DR. B. R. SHURLY, Detroit: The new problem of changing medical economics has brought with it a wave of control and jurisdiction by the various county societies over the dispensaries and outpatient departments in our large cities. It is well and good that some modification and control of a reckless and ruthless increase of patients in the dispensaries that have been not carefully guarded, as to who may be their family doctor and where they may likely be sent, is a very judicious criticism. It seems to me that the county society and the practitioner in general must realize that there are two distinct classes of outpatient departments; one that is truly and instinctively the teaching ideal, the idea of a student contact, which is absolutely essential to the medical school. We could greatly improve our outpatient service by paying the men who serve in that service, and we have in Detroit established that feature of the outpatient teaching department, whereby men shall receive some remuneration for their services. The new wave that has come over our profession is the wave of specialism, and the large number of 35 per cent of our men classified either rightly or by themselves as specialists is an alarming fact. It has been my privilege to be on the Board of Examiners for Otolaryngology, and during nine or ten years we have examined more than 2,000 men. The feeling which I have is that our medical education should be most certainly modified and directed more strenuously away from specialism and more highly concentrated on the fundamentals of bedside medicine and the outpatient department, with its fundamentals and basic interrelationships between the physician and the patient. It is not unusual for us to examine men who have patients under their observation in the outpatient department as we examine them and who have acute diseases, acute discharging ear or acute throat disorder, who will never take their temperature, never feel their pulse and never suggest the examination of their chest. Should we not come back more strongly in our medical schools to this fundamental basic outpatient department, where our men will be taught psychologically and economically and generally that the great service of the physician is the understanding of his patient and the grand humanitarianism that has gone through these many years with our general practitioners?

(To be continued)

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST; SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

CALIFORNIA

Society News.—Dr. Kenneth H. Sutherland, Santa Ana, was chosen president-elect of the Southern California Public Health Association at its recent annual meeting, and Raymond V. Stone, director, bureau of laboratories, Los Angeles County Health Department, Los Angeles, was installed as president. ——The Los Angeles County Medical Society offered a non-medical program at its general meeting, March 19; Mr. Maurice Zam, concert pianist, and Mr. Alexander Kisselburgh, concert stage baritone, performed, and William A. Fowler, B.E., of the California Institute of Technology, Pasadena, discussed "Recent Developments in Physics," and Dr. Arthur Elmer Belt, "Book Hunting—A Sport for the Doctor's Leisure."

Annual Tuberculosis Meeting.—The California Tuberculosis Association held its annual meeting in Sacramento, April 2-4. Guest speakers included Dr. Jay Arthur Myers, Minneapolis, on "The Contribution of Organization," and Mr. Homer N. Calver, New York, "Respiratory Diseases, an Unmet Challenge." Dr. Myers also addressed the annual banquet. Other speakers included Drs. Louis H. Fales and Elphege A. Beaudet, Livermore, "Some Factors Influencing the Reactivation of Patients Discharged from Our Sanatoria"; Ross W. Harbaugh, San Francisco, "Tuberculosis as an Industrial Problem"; Emil Bogen, Olive View, "Thermotherapy in Tuberculosis"; John C. Jones, Los Angeles, "Lobectomy for Uncontrolled Pulmonary Hemorrhages in Tuberculosis," and Sidney J. Shipman, San Francisco, "Tuberculous Stenosis of the Bronchus."

COLORADO

Society News.—Dr. Johnson E. Naugle, Sterling, among others, addressed the Northeast Colorado Medical Society in Sterling, March 12, on pleurodynia.——Dr. Harry Gauss, among others, addressed the Medical Society of the City and County of Denver, April 7, on "Gastro-Intestinal Symptoms of Pelvic Origin."

Spring Graduate Clinics.—The annual spring graduate clinics presented by the Pueblo County Medical Society under authorization of the committee on postgraduate clinics of the Colorado State Medical Society will be held in Pueblo, April 29-May 1. Sessions will be held at St. Mary's, Colorado State and Parkview hospitals. Guest speakers will include Dr. William W. Wasson, Dr. Walter W. King, Paul Maltby Clark and Paul P. Prosser, attorneys, all of Denver. The subjects of Dr. Wasson and Dr. King will be "Medical Economics" and "The Doctor in Politics" respectively.

DELAWARE

Society News.—Dr. John M. T. Finney Sr., Baltimore, discussed "The Rôle of the Imponderables in Surgery" before the New Castle County Medical Society in Wilmington, April 21. Dr. William Wayne Babcock, Philadelphia, addressed the society March 17 on "Diagnosis and Treatment of Intestinal Malignancy and Hirschsprung's Disease."

DISTRICT OF COLUMBIA

Medical Bills in Congress.—H. R. 11548, introduced by Representative Mitchell, Illinois, proposes to direct the Commission on Licensure to Practice the Healing Art in the District of Columbia to issue a license to practice the healing art to Dr. Clarence Q. Pair. H. R. 12242 has been reported to the House with recommendation that it pass, proposing to revise the lunacy proceedings in the District of Columbia.

FLORIDA

Banquet to Medical Officers.—The Dade County Medical Society gave a banquet in Miami, February 26, in honor of Drs. James S. McLester, Birmingham, Ala., President, American Medical Association; Herbert L. Bryans, Pensacola, president of the Florida Medical Association, and Julius C. Davis, Quincy, past president of the state association.

Society News.—Dr. John J. Kindred, DeLand, addressed the Volusia County Medical Society in New Smyrna, March 10, on "Modern Conception of Epilepsy and Its Treatment."——Dr. Herbert L. Bryans, Pensacola, discussed medical economics before the Bay County Medical Association in Panama City, March 5. Other speakers included Drs. Julius C. Davis, Quincy, on medical legislation, and Walter C. Payne, Pensacola, infections of the cervix uteri.

GEORGIA

Statue of Dr. Crawford Long Unveiled.—A statue erected in Danielsville by the state of Georgia in honor of Dr. Crawford W. Long, the first physician to use ether anesthesia, was unveiled March 30. The legislature authorized the erection of the memorial at or near Dr. Long's birthplace. Mrs. O. A. Harper, daughter of Dr. Long, and E. C. Long Jr. assisted in the unveiling. Speakers included Governor Eugene Talmadge, Dr. Lamartine G. Hardman, Commerce, former governor; Dr. James E. Paullin, Atlanta, president of the state medical association, and Dr. Hugh H. Young, Baltimore.

Society News.—Dr. Cleveland Thompson, Millen, discussed "The Autonomic Nervous System" among other speakers before the Burke-Jenkins-Screven Counties Medical Society at a meeting in Millen, recently.——The Baldwin County Medical Society was addressed at Milledgeville, among others, recently, by Dr. Lovick P. Longino on "Vertigo and Its Relation to Infections of the Mastoid Antrum."——Speakers before the Chatham-Savannah Tuberculosis Association recently were Drs. John L. Elliott on pneumothorax, and Ruskin King, Savannah, new tuberculin purified protein derivative.——The Georgia Medical Society, Savannah, was addressed recently by Drs. Job C. Patterson, Cuthbert, on "Acid Ulcer with Especial Reference to Acute Perforation," and Charles K. McLaughlin, Savannah, "Convergent Strabismus."——At a meeting of the Colquitt County Medical Society in Moultrie, recently, Drs. James R. Paulk and John B. Woodall, both of Moultrie, discussed allergy and bronchial asthma, respectively.

ILLINOIS

Tumor Clinic.—Dr. Charles F. Geschickter of Johns Hopkins Hospital, Baltimore, conducted a tumor clinic at Silver Cross Hospital, Joliet, March 25. This was the third annual clinic of its kind. The first was conducted by the late Dr. Joseph C. Bloodgood, Baltimore, and the second by Dr. Geschickter.

Society News.—The Adams County Medical Society was addressed in Quincy, April 13, by Drs. Bernard Portis and Max Cutler, Chicago, on "Acute Surgical Abdominal Conditions" and "Recent Advances in the Treatment of Cancer" respectively.——At a meeting of the St. Clair County Medical Society in Belleville, April 1, Dr. Edward W. Cannady Jr., East St. Louis, discussed "Diagnosis and Treatment of Cardiac Arrhythmia." At the session in East St. Louis, April 2, Dr. James S. Templeton, Pinckneyville, addressed the society on "Responsibility of the Individual Doctor to His Profession."

Chicago

Society News.—Dr. Byrl R. Kirklin, Rochester, Minn., among others, presented "A Roentgen Study of the Stomach and Duodenum After Operation" before the Chicago Roentgen Society, April 9.——At a meeting of the Chicago Pathological Society, April 13, speakers included Drs. Paul E. Steiner on "Malignant Lymphogranulomatous (Hodgkin's Disease) Cirrhosis of the Liver" and Sol R. Rosenthal, "Tissue Lymphocytes in the Prognosis of Hodgkin's Disease."

Admiral Blackwood Leaves Provident Hospital.—Rear Admiral Norman J. Blackwood has announced his retirement as medical director of Provident Hospital, after more than five years service there. He graduated at Jefferson Medical College, Philadelphia, in 1888 and entered the navy in 1889, advancing through the grades until 1929, when he was retired as a rear admiral. Provident Hospital, a training center for Negro medical workers, is housed in the remodeled home of the old Chicago Lying-In Hospital. The development and maintenance of the center was made possible by a $3,000,000 fund subscribed in 1930, $1,000,000 of which was a gift from the General Education Board of the Rockefeller Foundation. Dr. John W. Lawlah, director of the institution's x-ray department, has been appointed to succeed Dr. Blackwood. He is 32 years of age and graduated from Rush Medical College in 1932.

INDIANA

Dr. Mettel Named Director of Child Health.—Dr. Howard B. Mettel, secretary of the Indianapolis Medical Society, has been appointed director of the department of child and maternal health of the state division of public health. This appointment is made under the provisions of the federal social security act, it is reported. Dr. Mettel graduated from the University of Michigan School of Medicine, Ann Arbor, in 1921.

Health at Evansville.—Telegraphic reports to the U. S. Department of Commerce from eighty-six cities with a total population of 37 million, for the week ended April 11, indicate that the highest mortality rate (31.1) appears for Evansville and for the group of cities as a whole, 12.9. The mortality rate for Evansville for the corresponding period last year was 11.6 and for the group of cities, 11.8. The annual rate for eighty-six cities for the fifteen weeks of 1936 was 13.7 as against a rate of 12.7 for the corresponding period of the previous year. Caution should be used in the interpretation of these weekly figures, as they fluctuate widely. The fact that some cities are hospital centers for large areas outside the city limits or that they have a large Negro population may tend to increase the death rate.

Society News.—At a meeting of the Tippecanoe County Medical Society in Lafayette, March 10, Dr. Delbert O. Kearby, Indianapolis, discussed diagnosis and treatment of chest diseases with the use of the bronchoscope and x-rays.——The Elkhart County Medical Association, Elkhart, was addressed March 5 by Dr. Charles W. Mayo, Rochester, Minn., on "Pain in Cholecystitis and Recurring Attacks of Pain Following Cholecystectomy."——Dr. Larue D. Carter, Indianapolis, discussed "Diagnosis of the Common Neurologic Diseases" before the Fayette-Franklin County Medical Society in Connersville, March 10.——The Kosciusko County Medical Society was addressed in Warsaw, March 10, by Drs. George N. Herring, Pierceton, and George W. Anglin, Warsaw, on mucous and tuberculous colitis, respectively.——At a meeting of the Muncie Academy of Medicine in Muncie, March 10, Drs. Ezra Vernon Hahn and Edwin Rogers Smith, Indianapolis, discussed "Head Injuries and Their Medicolegal Aspects."

IOWA

Society News.—The Iowa Hospital Association will hold its annual convention at the Hotel Fort Des Moines, April 27-28.——A symposium on cardiovascular diseases was presented before the Des Moines Academy of Medicine and the Polk County Medical Society March 31 by Drs. Lee Forrest Hill, Walter D. Abbott, Des Moines, and Allan G. Felter, Van Meter.

Public Health Meeting.—The tenth annual meeting of the Iowa Public Health Association will be held in Des Moines at the Hotel Savery, April 28. A symposium on the social security act has been arranged for the noon luncheon session with the following physicians participating: Albert J. Chesley, St. Paul; Walter L. Bierring, Des Moines; Joseph H. Kinna-

V 106
1936

man, Des Moines; Arthur Steindler, Iowa City, and Mae H. Habenicht, Des Moines. In addition the following physicians will present papers:

Raymond A. Vonderlehr, Washington, D. C., Syphilis as a Public Health Problem.
Carl F. Jordan, Des Moines, Progress in Communicable Disease Control.
Archibald L. Hoyne, Chicago, When Diphtheria Threatens to Take a Life.
Sidney O. Levinson, Chicago, Value of Human Convalescent Serum in Measles and Poliomyelitis.

KANSAS

Class in Public Speaking.—The committee on public education of the Sedgwick County Medical Society recently instituted a series of meetings to give members experience and training in public speaking. Assignments are made at each session and five minute talks are presented by several members at the following meeting. Other members offer criticism, and the chairman elected at each session is criticized on his conduct of the meeting. Thirty members of the society are enrolled.

Society News.—Dr. William J. Feehan, Kansas City, discussed "Fractures of the Neck of the Femur" before the Wyandotte County Medical Society, March 17. Clarence C. Little, D.Sc., managing director, American Society for the Control of Cancer, New York, also spoke.——Dr. John R. Nilason, Omaha, among others, addressed the Golden Belt Medical Society in Junction City, April 2, on "Surgical Conditions of the Esophagus."——The Marion County Medical Society was addressed recently in Marion by Drs. John B. Nanninga, Goessel, on "Death of an Infant from the Inhalation of Fumes from a Patent Asthma Cure" and Ralph R. Melton, Marion, "Kidney Tumors of Infancy."——Dr. Roland M. Klemme, St. Louis, discussed diagnosis and treatment of trigeminal neuralgia before the Sedgwick County Medical Society, Wichita, April 21.

LOUISIANA

State Medical Meeting at Lake Charles.—The fifty-seventh annual meeting of the Louisiana State Medical Society will be held at Lake Charles, April 27-29, with headquarters at the Charleston Hotel and under the presidency of Dr. Courtland P. Gray Sr., Monroe. Mr. St. Clair Adams, New Orleans, will give the annual oration Tuesday evening, and guest speakers will include:

Dr. Arthur T. McCormack, Louisville, The Health Unit and Its Problems.
Dr. Frank H. Hagaman, Jackson, Miss., Jaundice.
Dr. George B. Eusterman, Rochester, Minn., Gastric Carcinoma Masquerading as a Benign Lesion: With Particular Reference to the Small, Circumscribed Ulcerous Type.
Dr. John L. McGehee, Memphis, Tenn., Treatment of Acute Intestinal Obstruction.

Monday the dinner for past presidents of the society and memorial services for deceased members will be held and Tuesday evening Dr. Gray will receive the medal given each year to the retiring president. Other speakers on the scientific program will include:

Ernest Carroll Faust, Ph.D., New Orleans, Public Health Aspects of Parasitic Infections in the Southern United States, with Special Reference to Louisiana.
Dr. J. Rigney D'Aunoy, New Orleans, Poliomyelitis.
Dr. Edwin A. Secola, New Orleans, Physical Defects in Children of Preschool and School Age.
Dr. William H. Seemann, New Orleans, Endemic Typhus.
Dr. Morgan Smith, Jennings, Lobar Pneumonia.
Dr. Morris Shushan and Mr. Oscar Blitz, New Orleans, Factors Influencing Morbidity and Mortality in Benign Tertian and Estivo-Autumnal Malaria.
Dr. Melville W. Hunter, Monroe, Observations in Acute Coronary Occlusion.
Dr. Marion D. Hargrove, Shreveport, Auricular Fibrillation.
Dr. Rena Crawford, New Orleans, Congenital Heart Disease, with Reports of Cases and Presentation of Pathological Specimens.
Dr. Clifford R. Mayo, Shreveport, Maternal Welfare in Louisiana.
Dr. Daniel M. Moore, Monroe, Mycotic Infection of the Lungs.
Dr. Charles B. Odom, New Orleans, Use of Epidural Anesthesia in General Surgery.
Dr. David R. Womack, New Orleans, Treatment of Allergy with Nasal Ionization.
Dr. Emile A. Bertucci, New Orleans, Introduction of a New Vegetable Concentrate in the Treatment of Diabetes Mellitus.
Dr. Leon J. Menville, New Orleans, Preoperative Irradiation of Cancer of the Breast.

MICHIGAN

Scientific Exhibits Committee.—At a recent meeting of the Council of the Michigan State Medical Society, a scientific exhibits committee was created to take charge at the annual meeting at the Book-Cadillac Hotel, Detroit, September 21-24. Dr. Clifford T. Ekelund, Pontiac, is chairman, and other members are Drs. Samuel W. Donaldson, Ann Arbor, William M. German, Grand Rapids, and Arthur E. Schiller and Eldwin R. Witwer, Detroit. A new feature of the exhibit will be a hobby show.

Society News.—Dr. Loren W. Shaffer, Detroit, discussed "Dermatoses of Diagnostic Significance in General Medicine" before the Highland Park Physicians' Club, March 12.——At a meeting of the Genesee County Medical Society, March 4, Dr. William J. Cassidy, Detroit, discussed "Selective and Anastomotic Surgery in Life, Comfort and Extension." He addressed the Huron-Sanilac County Medical Society, March 6, on "Ectopic Pregnancy."——The Grosse Pointe Medical Club, Detroit, was addressed March 11 on "Modern Trend of Tuberculosis," by Dr. Bruce Douglas.——At a meeting of the Michigan Society for the Promotion of Dentistry for Children, March 11, the following Detroit physicians spoke: Roger S. Siddall, obstetrics; Allan L. Richardson, pediatrics; John A. Hookey, dermatology; Frederick J. Fischer, orthopedics; Arthur P. Wilkinson, ear, eye, nose and throat, and Benjamin I. Johnstone, the heart.

Department of Physical Therapy Dedicated.—The dedication of a new therapeutic pool and new quarters of the department of physical therapy of University Hospital, Ann Arbor, took place February 27. Preceding a tour of inspection, a luncheon was given for the heads of the various departments, executives of the university and the trustees of the Horace H. and Mary A. Rackham Fund, which financed the new pool. The department of physical therapy now occupies an entire wing of the basement floor of the hospital. The pool, which is only a portion of the unit, is 25 feet long and 15 feet wide and varies in depth from 2½ feet to 4½ feet. It is supplied by a constant recirculating system, which filters and chlorinates the water and maintains it at a temperature of 90 F. Paralyzed patients may be conveyed into and from the pool by means of a trolley arrangement. There are also two large tanks for individual treatments.

Tribute to Dr. Biddle.—The Wayne County Medical Society and the Detroit Dermatological Society sponsored a reception and dinner in honor of Dr. Andrew P. Biddle, April 1, to commemorate his completion of fifty years in the practice of medicine. Dr. Biddle graduated from Detroit College of Medicine, where he has been emeritus professor of dermatology since 1917. He was a member of the state board of health for six years, president of the Detroit Board of Education in 1925, president of the Detroit Library Commission in 1931 and a member since 1926. He is a charter member of the Wayne County Medical Society and in 1902 became the first editor of the *Journal of the Michigan State Medical Society*. He was president of the state society during the World War. He has also been president of the American Dermatological Society and of the Detroit Academy of Medicine. Speakers at the dinner included Judge Ernest A. O'Brien, former governor Fred W. Green, Rabbi Leo M. Franklin and Drs. Douglas Donald, Don M. Campbell, Loren W. Shaffer and Robert C. Jamieson.

MINNESOTA

University News.—A grant of $13,250 from the U. S. Public Health Service has made possible the establishment of special courses in public health work at the University of Minnesota, beginning with the spring quarter.

State Medical Meeting in Rochester.—The eighty-third annual session of the Minnesota State Medical Association will be held in Rochester, May 3-6, with headquarters at the Kahler Hotel and under the presidency of Dr. William W. Will, Bertha. Guest speakers will include the following physicians:

Leon Asher, Berne, Switzerland, Functions of the Spleen.
Elliott P. Joslin, Boston, Treatment of Diabetes.
Ferdinand Sauerbruch, Berlin, Germany.
Frederick A. Coller, Ann Arbor, Studies in Water Balance, Dehydration and the Administration of Parenteral Fluids.
Donald Guthrie, Sayre, Pa., Surgical Aspects of Peptic Ulcer.

Dr. Willis F. Manges, Philadelphia, will present the Russell D. Carman Memorial Lecture, sponsored by the Minnesota Radiological Society. His paper will be entitled "Foreign Bodies and the Use of X-Ray Examination in their Localization and Removal." Other physicians on the program will include:

Edward L. Tuohy, Duluth, Treatment of Gall Tract Disease as Determined by the Stage of Its Development and the Patient's General Condition.
Oscar E. Lechen, Crookston, Oxygen Therapy.
Henry E. Michelsen, Minneapolis, A Few Axioms in Dermatologic Diagnosis.
Martin O. Wallace, Duluth, Management of the Minor Ailments of Pregnancy.
Hiram J. Lloyd, Mankato, Congenital Heart Defects—Importance of Early Diagnosis.
Edward A. Regnier, Minneapolis, Management of Appendicitis.
George A. Earl, St. Paul, Rôle of Duodenojejunostomy for Duodenal Ileus and Duodenal Obstruction.
Olaf J. Hagen, Moorhead, Regional or Terminal Ileitis.
James J. Swendson, St. Paul, Production of Obstetrical Amnesia and Analgesia.

Edward N. Peterson, Eveleth, Blood Transfusion.
Orwood J. Campbell, Minneapolis, "Bumper" Fractures of the Tibia.
Warner G. Workman, Tracy, Erythema Multiforme, Complicated by Severe Gastro-Intestinal Disturbances and Hemorrhage from Mucous Membranes in a Primipara.
Frederic E. B. Foley, St. Paul, Surgical Treatment of Hydronephrosis, a New Operation for the Relief of Ureteropelvic Junction Stricture.
Mark H. Tibbetts, Duluth, Changes in Aortic Shadows Following Injuries to the Spine.
Morse J. Shapiro, Minneapolis, Diagnostic and Therapeutic Problems in Heart Disease in Children.
Gordon R. Kamman, St. Paul, Correlations Between Variations in Barometric Pressure and Incidence of Cerebral Hemorrhage.
Leo G. Rigler, Minneapolis, The Roentgen Findings in Biliary Fistula.
George N. Rohberg, St. Paul, Myxedema, Its Nervous and Mental Manifestations.
Charles H. Mead, Duluth, Ovarian Hemorrhage Simulating Acute Appendicitis.
Everett K. Geer, St. Paul, Active Pulmonary Tuberculosis Without Symptoms.
Reuben A. Johnson, Minneapolis, Gonorrheal Pelvic Inflammatory Disease.

Monday afternoon there will be a symposium on causes, diagnosis and treatment of hay fever by Drs. Ralph V. Ellis and Horatio B. Sweetser Jr., Minneapolis, and C. O. Rosendahl, Ph.D. An evening meeting Monday will be addressed by Drs. Charles W. and William J. Mayo, Rochester; Mrs. Ernest M. Hammes, St. Paul, president-elect, woman's auxiliary; Dr. Olin West, Secretary and General Manager, American Medical Association, and Dr. Will. Among the exhibits will be one on crime detection methods, prepared by the federal bureau of investigation.

MISSISSIPPI

Personal.—Dr. Charles D. Mitchell, Gulfport, has been appointed superintendent of the Mississippi State Hospital, Whitfield.——Dr. John W. Dugger, Jackson, has been named director of the Pearl River County Health Unit, succeeding Dr. George E. Godman, Poplarville, who resigned.——Dr. Roger Mayo Flynt has been appointed superintendent of the Newton Infirmary, Newton.

Society News.—At a meeting of the Northeast Mississippi Thirteen County Medical Society in Starkville, March 17, speakers included Drs. Robert D. Kirk Jr., Tupelo, on "Abuse of Uterine Curette," and Henry G. Rudner, Memphis, Tenn., "Agranulocytosis."——Dr. Norman E. Applewhite, Jackson, read a paper on "Some Phases of Peroral Endoscopy" before the Central Medical Society in Jackson, February 4.

NEBRASKA

Alumni Dinner at Kansas City.—The alumni of the University of Nebraska College of Medicine will meet at a dinner during the annual session of the American Medical Association in Kansas City, Mo., Wednesday evening, May 13, at the Hotel Kansas Citian. Dr. Benjamin L. Myers, 1115 Grand Avenue, Kansas City, is chairman.

Society News.—Drs. Esley J. Kirk and Howard B. Hamilton, Omaha, addressed the Scottsbluff County Medical Society, March 12, on "Diseases of the Kidney" and "The Respiratory Tract from the Standpoint of Pediatrics" respectively. At an evening meeting the speakers presented papers on "Lung Conditions in Children" and "Problems of Water Balance" respectively.——Drs. John F. Gardiner and James F. Kelly, Omaha, addressed the Omaha-Douglas County Medical Society, April 28, on "Difficulties in the Recognition of Hypothyroidism" and "Use of the X-Rays as an Aid in the Treatment of Infectious Processes" respectively.

NEW HAMPSHIRE

Society News.—Drs. Clifton S. Abbott, Laconia, and Carleton R. Metcalf, Concord, president and secretary respectively of the New Hampshire Medical Society, addressed the Belknap County Medical Society, Laconia, recently.——Dr. Dudley Merrill, Boston, recently addressed the Hillsborough County Medical Society on "Dangers Inherent in the Clinical Diagnosis of Cancer."——A commission for the study of occupational diseases was recently appointed with Dr. Robert J. Graves, Concord, as chairman. Among members are Drs. Emery M. Fitch, Claremont, and David W. Parker, Manchester.

NEW JERSEY

Graduate Lectures.—The Camden County Medical Society is sponsoring a series of graduate lectures during April and May. The series is as follows:

Dr. William Goldring, New York, April 8, Nephritis, and April 15, Hypertension, Hypertensive and Arteriosclerotic Heart Disease.
Dr. Eldridge L. Eliason, Philadelphia, April 22, Diagnosis of Surgical Abdominal Conditions.
Dr. Jacob Irving Fort, Newark, April 29, fracture clinic.
Dr. Charles Hendee Smith, New York, May 6, pediatric clinic.
Dr. Robert A. Matthews, Philadelphia, May 13, The Commoner Psychoses.

NEW MEXICO

State Medical Meeting at Carlsbad.—The annual meeting of the New Mexico Medical Society will be held at Carlsbad, May 6-8, with headquarters at the Crawford Hotel. Among speakers will be:

Dr. Donald H. O'Rourke, Denver, A Consideration of Eye Problems of the General Practitioner.
Dr. Leslie M. Smith, El Paso, Texas, Atopic Dermatitis and Contact Dermatitis.
Dr. Charles L. Martin, Dallas, Texas, Advanced Cancer About the Head and Neck.
Dr. Benjamin L. Schoolfield, Dallas, Indications for Open Operation in Fractures.
Dr. E. Payne Palmer, Phoenix, Ariz., Emergency Treatment of Fractures.
Dr. Alexander E. Brown, Rochester, Minn., Clinical Aspects of Jaundice.
Dr. John L. Murphy, El Paso, Varicose Veins.
Dr. James Shirley Sweeney, Dallas, Modern Concept of Diabetes Mellitus.
Dr. George Turner, El Paso, Blood Transfusion.
Dr. Clarence B. Ingraham Jr., Denver, Sterility.
Dr. Adolf W. Muthauf, El Paso, Practical Points in Diagnosis and Treatment of Cystitis.
Dr. Fred W. Standefer, Lubbock, Texas, Allergy—Its Relation to Diseases of the Eye.

In the public health section, which meets Thursday, May 7, speakers will include Drs. William W. Bauer, Chicago, director, Bureau of Health and Public Instruction, American Medical Association; Reginald M. Atwater, executive secretary, American Public Health Association, New York, and Karl F. Meyer, Ph.D., San Francisco. Friday's sessions, a luncheon round table session and a general meeting, will be held at the Carlsbad Cavern. Dr. Mallory B. Culpepper, Carlsbad, will be installed as president at the opening session Wednesday, to succeed Dr. Charles W. Gerber, Las Cruces.

NEW YORK

Society News.—A symposium on cancer of the larynx was presented at the annual meeting of the Eastern New York Eye, Ear, Nose and Throat Association in Schenectady, April 15, by Drs. Chevalier Jackson, Chevalier L. Jackson and William Edward Chamberlain, all of Philadelphia.——Dr. Hugh Cabot, Rochester, Minn., addressed the Medical Society of the County of Westchester, Valhalla, April 21, on "Management of the Cryptorchid." Dr. Frederick A. Coller, Ann Arbor, Mich., addressed the society, March 17, on "Water Balance and Dehydration in the Sick Patient."——The Medical Society of the County of Rensselaer began the publication of a bulletin with the April issue. The society was addressed, April 14, by Mr. Dwight Marvin on "The Physician as a Layman and an Editor Sees Him"; Drs. Alson J. Hull, "Cooperative Medical Practice," and Augustus J. Hambrook, Troy, "Hard of Hearing Problems in Our School Children and Methods for Correction."

New York City

Personal.—Dr. Morris Hinenburg, assistant director of Montefiore Hospital for Chronic Diseases, New York, has been appointed director of the Jewish Hospital of Brooklyn.——Dr. Milton Benjamin Rosenbluth has been appointed visiting physician to Bellevue Hospital.——Dr. Herman J. Burman has been appointed assistant professor of clinical otolaryngology at the New York Post-Graduate Medical School.——Dr. James Alexander Miller has been appointed administrative consultant in tuberculosis to the city department of hospitals.

Annual Physicians Art Show.—The ninth annual exhibition of the New York Physicians Art Club was on view April 6-18 at the New York Academy of Medicine with 223 items varying from oil paintings to cabinet work. Landscapes and still life paintings were most numerous among the exhibits. Two memorial groups were shown, one a group of water colors by the late Dr. Albert Henry Fridenberg, the other an unfinished sculpture left by the late Dr. Walter Béran Wolfe. The exhibition also included photographs and craft work.

NORTH DAKOTA

Diploma Lost.—Dr. William John Pangman, Wahpeton, recently reported the loss of his medical diploma from the College of Medical Evangelists, Los Angeles, dated June 21, 1931.

Personal.—Dr. James P. Widmeyer, who has been in active practice at Rolla for more than forty years, has been made an honorary life member of the Devils Lake District Medical Society.——Dr. Leslie G. Eastman, Hazen, was elected president of the North Dakota Sixth District Medical Society recently; Dr. George M. Constans, Bismarck, vice president, and Dr. Leonard W. Larson, Bismarck, secretary.——Dr. J. W. Moreland, Carpio, has been appointed health officer of Ward County, succeeding Dr. Henry L. Halverson, Minot, who resigned.

V 106
1936

OREGON

New Officers of State Board.—At a meeting of the state board of medical examiners, April 1, Dr. Charles C. Newcastle was elected president; Dr. Joseph F. Wood, secretary, and Dr. Linford S. Besson, treasurer. All are of Portland. Other members of the board are Drs. Elza D. Johnson, Klamath Falls, and Carl G. Patterson, Baker, and J. L. Ingle, D.O., La Grande. The board adopted regulations to govern licensure of graduates of foreign medical schools. Such applicants must be citizens of the United States and must present satisfactory premedical requirements as outlined by the Council on Medical Education and Hospitals of the American Medical Association and the Association of American Medical Colleges. They must present diplomas indicating graduation from foreign schools that are in good standing in the opinion of the board and they must possess licenses to practice in the country in which they were graduated. Finally, each applicant must satisfy the board that after receiving the foreign diploma and license he has served an internship in a hospital approved by the board.

PENNSYLVANIA

Society News.—Dr. Hugh H. Young, Baltimore, addressed the Cambria County Medical Society, Johnstown, April 9, on "Urologic Problems of General Interest." —— Dr. Paul P. Riggle, Washington, addressed the Washington County Medical Society, April 8, on "Peptic Ulcer and Gastric Carcinoma."

Philadelphia

Woman Physician Honored.—Dr. Marie K. Formad was guest of honor at a banquet at the Bellevue-Stratford, March 16, celebrating fifty years of service at the Woman's Hospital. Dr. Mary R. H. Lewis, director of the hospital, presided and Dr. Alberta Peltz, president of the staff, presented contributions amounting to $1,000 to the hospital to be known as the Marie K. Formad Endowment Fund. Dr. Formad graduated from the Woman's Medical College of Pennsylvania in 1886.

The Johnson Lectures in Medical Physics.—Drs. Joseph Erlanger, professor of physiology, Washington University School of Medicine, St. Louis, and Herbert S. Gasser, director, Rockefeller Institute for Medical Research, New York, gave the lectures of the Elbridge Reeves Johnson Foundation for Medical Physics at the University of Pennsylvania, March 31-April 7. The subject was "Electrical Signs of Nerve Activity." Both lecturers spoke at the introductory session, March 31, and succeeding lectures were:

April 1: Analysis of the Compound Action Potential of Nerve, Dr. Erlanger.
April 2: Comparative Physiologic Characteristics of Nerve Fibers, Dr. Erlanger.
April 3: Some Reactions of Nerve Fibers to Electrical Stimulation, Dr. Erlanger.
April 6: Sequence of the Potential Changes, Dr. Gasser.
April 7: The Irritability Cycle, Dr. Gasser.

At the opening session the honorary degree of doctor of science was conferred on Dr. Gasser and Dr. Erlanger by the university.

Pittsburgh

Flood Waters in Doctors' Offices.—Flood waters in the printing plant that publishes the *Pittsburgh Medical Bulletin* and in the building containing the offices of the Allegheny County Medical Society made it impossible to print the issues of the bulletin for March 21 and 28. The issue of April 4 quotes the following editorial tribute to Pittsburgh physicians published in the Pittsburgh *Post-Gazette*, March 24:

It was characteristic of their profession that 600 Pittsburgh physicians should immediately have volunteered their services in guarding the public health in the wake of the flood.

In such crises the doctors are always in the first line of defense, working unselfishly, heroically. And how quietly and effectively they work.

There could be no higher tribute to the profession than the fact that it was expected to do this as a matter of course—and it never disappoints.

Pittsburgh newspapers, issued from the presses of papers in neighboring towns, carried messages of advice to the flood stricken area from city, county and state health authorities and the county medical society, the bulletin said. Radio station KDKA also cooperated under the greatest difficulties in broadcasting such advice as could be given by the health authorities. The Pittsburgh bulletin quoted a communication from the Medical Society of the State of Pennsylvania, as follows: "We cannot close this communication without bringing to your sympathetic attention the plight of probably 200 of our state society members scattered across the state (fifty of them in Johnstown), through whose first floor combined offices and residences flowed from 5 to 12 feet of destructive flood waters."

SOUTH DAKOTA

State Medical Meeting at Sioux Falls.—The fifty-fifth annual session of the South Dakota Medical Association will be held in Sioux Falls, May 4-6, with headquarters at the Cataract Hotel. Guest speakers will be:

Dr. Robert D. Schrock, Omaha, Fractures of the Elbow and Fractures of the Knee Joint.
Dr. Jay Arthur Myers, Minneapolis, Modern Methods of Controlling Tuberculosis.
Dr. Rosco G. Leland, Chicago, director, Bureau of Medical Economics, American Medical Association, Changes Confronting Modern Medicine.
Dr. Robert Glenn Allison, Minneapolis, subject not announced.
Dr. Joseph C. Ohlmacher, dean, University of South Dakota School of Medicine, Vermillion, Organic Basis for Hypo-Insulinism and Hyperinsulinism.
Dr. Elliott P. Joslin, Boston, clinic on diabetes.

The South Dakota Academy of Ophthalmology and Otolaryngology will meet, May 6, with the following speakers: Drs. Otis R. Wolfe, Marshalltown, Iowa, "Cataract Extraction by the Barraquer Method" and William H. Griffith, Huron, "Schilling Hemogram in Acute Infections." Dr. Albert S. Rider, Flandreau, is president of the state medical association and Dr. James L. Stewart, Nemo, president-elect.

UTAH

New Health Commissioner.—Dr. Thomas J. Howells has recently been appointed health commissioner of Salt Lake City to succeed Dr. Sol G. Kahn. Dr. Howells was graduated from Jefferson Medical College, Philadelphia, in 1910.

GENERAL

Milk Commissions to Meet.—The annual joint meeting of the American Association of Medical Milk Commissions and the Certified Milk Producers' Association of America will be held in Kansas City, May 11-12, at the Hotel Baltimore, under the presidency of Dr. Milton J. Rosenau, Chapel Hill, N. C. Among speakers will be:

Boyd S. Gardner, D.D.S., Rochester, Minn., Nutrition as Affecting the Teeth.
Dr. Paul J. Zentay, St. Louis, Problems Ahead for Certified Milk.
Dr. Harold L. Barnes, Brooklyn, Shall We Continue to Certify Milk?
Dr. Oscar Reiss, Los Angeles, A Suitable Milk for Infant Feeding.
Dr. Edwin T. Wyman, Boston, Milk in Infant Feeding.
Dr. Hugh L. Dwyer, Kansas City, Importance of Certified Milk in the Diet After Infancy.
Conrad A. Elvehjem, Ph.D., University of Wisconsin, Madison, The Growth Promoting Factor in Milk.

Association for Research in Ophthalmology.—The annual meeting of the Association for Research in Ophthalmology will be held May 12 in Kansas City at Edison Hall, Power and Light Building. The program is as follows:

Dr. Otto Barkan, San Francisco, Goniotomy or Incision of Schlemm's Canal for Chronic Glaucoma—Results of Goniscopic Research.
Dr. Earl L. Burky, Baltimore, Studies on the Action of Staphylococcus Toxin and Antitoxin, with Special Reference to Ophthalmology.
Drs. Richard F. Thompson, Edward Gallardo and Devorah Locatch:-Khanaa, New York, Precipitins in the Ocular Tissues of Rabbits Generally and Locally Immunized with Crystalline Egg Albumen—Their Relationship to Allergy.
Dr. George E. Park, Chicago, An Investigation of the Angular Relations of the Visual and Optic Axes.
Dr. Karl Meyer and John W. Palmer, Ph.D., New York, The Nature of Ocular Fluids.
Drs. William M. James and A. J. Siefker, Ph.D., St. Louis, Observations on the Reducing Substances (Glucose) of the Aqueous and Vitreous Humors of the Eye.
Drs. Placidus J. Leinfelder and Harold D. Kerr, Iowa City, Roentgen-Ray Cataract—An Experimental, Histologic and Clinical Study.
Dr. Conrad Berens, Edith L. Nilson and George H. Chapman, New York, Iritis Produced in Rabbits' Eyes by Intravenous Injection of Crude and Purified Cultures of Bacteria Isolated from Patients with Certain Inflammatory Eye Diseases.

Medical Bills in Congress.—*Change in Status:* H. R. 3629 has been vetoed by the President, proposing to authorize the acquisition of additional land for Walter Reed General Hospital. *Bills Introduced:* S. 4429, introduced by Senator Thomas, Utah, proposes to create an executive department of the government to be known as the Department of Education and Public Welfare. S. 4489, introduced by Senator Hatch, New Mexico, proposes to provide compensation and medical care for enrolees in the Civilian Conservation Corps suffering disability or death resulting from injury sustained in the performance of duty. H. R. 12300, introduced by Representative Smith, Washington, proposes to provide a uniform rate of pension for unmarried Spanish-American War veterans without dependents while hospitalized, and to extend hospitalization to persons recognized as veterans of the Spanish-American War under laws in effect prior to March 20, 1933. H. R. 12245, introduced by Representative Scrugham, Nevada, proposes to authorize the President to provide for employing unemployed citizens of the United States to discover and develop the mineral resources of the public lands of the United States, and to provide medical care and hospitalization for such employees.

Foreign Letters

LONDON

(From Our Regular Correspondent)

March 17, 1936.

Is Marriage of Cousins Dangerous?

In a letter to the medical journals, Prof. J. B. S. Haldane states that the Committee on Human Genetics, appointed by the Medical Research Council, has obtained the cooperation of hospitals in an extensive inquiry on the question of the danger of marriages between cousins. All patients in the participating hospitals are being asked whether their parents were related and if so how. The preliminary results are encouraging. Certain rare conditions seem to be rather commoner among the progeny of related than among those of unrelated parents. But the results will not be statistically significant until at least three times the present number of cards have been completed. More data are particularly desired from country districts, where more inbreeding occurs than in towns.

There has long been the belief that human inbreeding is undesirable and some unions of blood relations are forbidden by law. Professor Haldane points out that recent research has shown that certain diseases are much more common among the offspring of blood relations than in the general population. The following percentages of marriages between first cousins have been found among the parents of patients suffering from the following diseases: xeroderma pigmentosum, 47; retinitis pigmentosa, 27; juvenile amaurotic idiocy, 15; ichthyosis congenita, 14. But researches into rare diseases gives little idea of the importance of the phenomenon for general health. The fact that the children of first cousins are some thirty times more likely to develop retinitis pigmentosa than the general population does not show whether such abnormalities (due to rare autosomal recessive gene substitutions) are sufficiently common to render the marriage of cousins undesirable. Animal experiments give no clear answer. In some species the inbreeding of members of wild populations leads to numerous recessive abnormalities; in others it does not. Hence the need for the present investigation.

Air Raid Precautions

The precautions recommended by the government against gas poisoning in air raids have been reported in previous letters. Under the title "Rescue Parties and Clearance of Débris" the Air Raids Precautions Department of the government has issued a memorandum describing the organization recommended for dealing with buildings and roads. It is suggested that this should be attached to the highway department of the local authorities. Whatever area becomes the unit of organization, arrangements should be made with neighboring areas for assistance in case of need. Rescue parties should be organized to release persons trapped in damaged buildings. They should consist of six or eight men including a skilled foreman. For a densely populated area three or four rescue parties should be provided for every 100,000 of population (two on duty and two in reserve). Apart from their value in time of war, the memorandum adds, persons trained in rescue work might be of value in the case of the collapse of a building in time of peace. Attention is directed to the difficult and dangerous nature of the work, and it is suggested that skilled men should be used in the nucleus of the organization. For training men in the kind of equipment required, assistance could be obtained from such local sources as the fire brigade, mine rescue stations, engineering works, and builders and demolition contractors. Some training in first aid and in the use of gas respirators is also suggested. The occupants of property liable to flooding in the event of an air attack should be warned against taking refuge in basements or ground-floor rooms.

Antigas Instructions

The government has issued a circular to all the county and borough councils giving the arrangements for a course of instruction at the civilian antigas school to be established at Failfield, Gloucestershire. The government will train instructors at the school, who can be obtained by the local authorities for instruction in their localities. The government will also provide the necessary respirators and protective clothing for local training. The syllabus for the general course will include the principles of civilian antigas precautions, first aid, decontamination and recognition of poison cases. There will also be specialist courses. Each course will as far as possible be composed of persons interested in antigas measures from a common standpoint. Thus separate courses will be provided for instructors primarily concerned in the following duties: (1) police and fire department; (2) first aid, rescue and ambulance work; (3) decontamination of materials; (4) repair of water and gas pipes, cables and wires that may be contaminated by gas. Two specialist courses, each lasting a week, are contemplated at present. One will be for physicians and nurses and will deal with the medical treatment and care of gas casualties. The other will be for the training of chemists in the detection and identification of gases.

International Congress of Physical Medicine

The sixth International Congress of Physicial Medicine will be held in London from the 12th to the 16th of May. Lord Horder is the president of the British section, Sir Robert Stanton Woods chairman of the executive committee and Sir Henry Gauvain chairman of the general committee. The congress will consist of full members and associate members. Full members will be physicians. Associate members will include medical students, members of the Society of Radiographers, biophysical assistants, state-registered nurses, and members of the Chartered Society of Massage and Medical Gymnastics. Associate members may attend scientific meetings but not take part in discussions. The fee for full membership of the British section is $10 and for associate members $2. For foreign members the fees are respectively 250 and 100 Belgian francs. There will be six sections: (1) Kinesitherapy, (2) Physical Education, (3) Hydrotherapy and Climatotherapy, (4) Electrotherapy, (5) Actinotherapy, (6) Radiotherapy and Radium Therapy. The official language will be English, but papers in French, Italian or German will be received. Physicians who wish to take part in the congress should communicate with the honorary secretary, Dr. Albert Eidinow, 4 Upper Wimpole Street, London, W. 1.

Sir Charles Ballance

The death at the advanced age of 79 of Sir Charles Ballance removes a great neurologic surgeon of the past generation, whose scientific activities continued almost to the end. Educated at St. Thomas's Hospital, he graduated at London University and obtained gold medals at the B. S. and M. S. examinations. In 1895 he was appointed aural surgeon to St. Thomas's Hospital and later assistant surgeon and surgeon. He also became surgeon to the Evelina Hospital for Children and to the National Hospital for the Paralyzed and Epileptic, where Sir Victor Horsley was his surgical colleague. His scientific bent was evident from the first. While waiting for practice he began an investigation into the changes in the coats of the large arteries after ligation. The work began in 1885, under the guidance of Professor Birch-Hirschfeld at Leipzig, was continued in London at the Brown Institute, when Horsley was superintendent, and was concluded in the medical school of St. Thomas's Hospital with the help of Walter Edmunds. The results were published in 1891 under the title "A Treatise on the Ligation of the Great Arteries in Their Continuity, with Observations on the Nature, Progress and Treatment of

V 106
1936

FOSTER LIBRARY

Aneurysm." The value of the work was recognized immediately and established its authors in a high position as surgical investigators. In 1919 he published a profusely illustrated monograph, "Essays on the Surgery of the Brain." But his most important researches, based on elaborate experiments, were those on nerve suture and nerve grafting. As early as 1901 he published, in collaboration with Sir James Purves-Stewart, a preliminary work showing the exact process by which peripheral nerves become reunited after division. His indefatigability in pursuing this subject is shown by the fact that as late as 1934 he was writing on the operative treatment of facial palsy. Restrictions on experiments in this country caused him to go to America, where his work on this subject in collaboration with Arthur Duel is well known. This was not his first visit, for he had previously worked there with Cushing. He had intimate relations with the Royal College of Surgeons, of which he was vice president and where he was a well known figure as a lecturer. Almost to the end he was working at the college laboratories at Down. He was the founder and first president of the Society of British Neurological Surgeons. Other important works from his pen were "Points in the Surgery of the Brain and Its Membranes" and "Essays on the Surgery of the Temporal Bone." His enthusiasm for surgery was such that at the age of 77 he journeyed to Edinburgh and Aberdeen to show his films of experimental nerve anastomosis.

PARIS

(From Our Regular Correspondent)

March 29, 1936.

The Annual French Congress on Hygiene

The twenty-second annual meeting of the Société de médecine publique was held at the Pasteur Institute. The president for 1935 was Professor Lereboullet of Paris. The subjects taken up were infant feeding, hygiene of institutions for nurslings, and social organization for the protection of children.

Jules Renault of Paris discussed the hospitalization of infants. Every hospital should be divided into small wards of ten or twelve beds in order to limit the spread of contagious diseases, which seem to arise no matter what precautions are employed. Secondly, each ward should be divided into cubicles with glass for two thirds of the height of the partition. Each cubicle should be so equipped for heliotherapy that it will not be necessary to move the child. Ample facilities should be afforded for air conditioning, the temperature being maintained constantly at between 70 and 72 F. and the humidity between 40 and 70 degrees. These conditions have existed in his service at the Hôpital St. Louis since 1922 and have resulted in a greatly reduced mortality.

Robert Debré of Paris pleaded for better isolation of nurslings suffering from contagious diseases, as well as special training for the nursing personnel in such institutions. Visits from parents and other relatives should be forbidden.

Lereboullet and Bohn stated that the commoner infectious diseases played the most important part in the mortality of children in the first two years. The mode in which the infection is carried is by direct contact. Cassoute of Marseilles stated that as the result of isolation and cubicles the mortality, which had been 53 per cent in 1920, was only 2.32 per cent in 1934.

In the discussion of the second subject, organization of protection of infancy, Leclainche said that this work was now under government supervision instead of being left to private initiative. Those charged to carry out the duty of saving 50,000 infants every year should be impressed with the necessity of prevention as well as assistance.

Hurtado spoke on the coordination of public and private institutions that take care of very young children. Thus far the burden has been borne by private institutions, which receive only a pittance from the state. There is still much confusion as to the work to be undertaken by private and public institutions. The government should not ignore the efforts of non-public institutions. A careful survey should be made of every portion of France and its colonies in order that a better coordination of existing and of desirable resources may be made. Only through team work between government officials and physicians in charge of infant hospitals can progress be made. The social insurance authorities in the Parisian region have confided all work of maternal and infant protection to a special organization, which has been successful in cutting down the mortality.

Abuse of Treatment with Gonadotropic Substance in Undescended Testes

In the *Presse médicale*, March 25, Prof. Georges Marion reports a case in which he warns against the use of gonadotropic substances by those whose knowledge of the variations in the mode of descent of the testis is limited. If the testis is simply arrested in its descent, it is found either in the iliac fossa or in the inguinal canal or it has passed through the canal but is arrested in the upper part of the scrotum just distal to the external abdominal ring. Cases in which the testis is unable to migrate to its normal position in the scrotum are the only ones in which one is justified in a trial of non-operative treatment. There is another totally different group of cases in which the testis is not checked in its descent but migrates so that it lies over the symphysis pubis, over the upper femoral region and in the perineum. The case reported by Professor Marion belonged in the second (femoral) subgroup of migrating or aberrent testes. It is useless to treat these cases by the same method as one might employ in arrest of descent. Marion's patient was 15 years of age with marked deficiency in development of the external genitalia and no palpable evidence as to where the testes were located. At operation, the testis on each side was found over Scarpa's triangle and was about the size of a bean. The testes were replaced in the scrotum. Following the operation, inquiry revealed that the boy had been given gonadotropic substance since the age of 10 years. No effort apparently had been made to distinguish between an arrested descent and an abnormal migration of the testis. Professor Marion deplored the fact that the late operation would be of no avail in stimulating the development of the testis, since it is well known that such an organ will not develop unless an operation (orchidopexy) is performed at as early a period as possible before puberty. If the administration of gonadotropic substance has not been followed by complete descent into the scrotum when the boy reaches the age of 10 or 12 years, operation is indicated.

A Donor Who Has Given 257 Liters of Blood

A workman, Raymond Briez, in the public markets of Paris, has been the donor of 257 quarts (liters) of blood since 1924. In that year he furnished the blood for four transfusions and in 1925 for thirty-eight. In 1927 the number attained the astonishing figure of ninety-four and from that year to 1935 averaged from fifty to sixty a year. In 1935 there were ninety-eight transfusions in which the blood was furnished by Briez. The average amount for each transfusion was about 10 ounces (300 cc.). No ill effects have ever been noted and Briez is always ready for another call.

Report of the American Hospital of Paris

At the recent annual meeting of the board of governors of the American Hospital the president, Mr. Arthur T. Kemp, stated that there had been an increase in revenue as compared to the previous year of 230,276 francs (about $15,000). The revenue from investments showed a decrease of 60,000 francs (about $4,200). The total operating expenses were 63,000 francs ($4,500) more than in 1934. Hospital service rendered to patients unable to pay in whole or in part amounted to

916,930 francs ($61,128). Mr. Edward B. Close is voluntarily filling the chair of manager, giving all his time to the hospital. Dr. Edmund L. Gros was reappointed chief of the medical staff. Dr. Thierry de Martel was named chief of the surgical and Dr. Lawrence S. Fuller chief of the medical service.

Lectures on Cardiology at Royat

Royat, a city in central France, is the principal resort which specializes in the treatment of diseases of the heart and blood vessels. A course of conferences open to cardiologists of all countries will be given May 31 and June 1 under the supervision of a committee headed by Professor Vaquez. The other members will be Professors Clerc, Laubry, Castaigne, Lian, Gallavardin and Dumas. Among the subjects on which papers will be read, the following are especially to be noted: physiology of vascular tonus (Heymans of Ghent, Belgium, and Brouha of Liége, Belgium), cerebral vascular spasms (Riser of Toulouse), vascular spasms of the extremities (Leriche and Fontaine of Strasbourg), vascular spasms in their relation to endocrinology (Marañon and Duque of Madrid, Spain) and treatment of vascular spasms (Loeper of Paris). Cardiologists wishing to attend can secure information through Dr. R. Boucomont, Royat (Puy de Dome), France.

Cure of Staphylococcic Septicemia with Staphylococcus Anatoxin

Another instance of the cure of a severe generalized staphylococcic infection was reported at the same meeting by Merklen and his associates. A man, aged 33, was admitted Oct. 11, 1935, with the clinical picture of the severe septicemia. The illness began during August as a deep-seated infection of the right little finger with gradual appearance of the symptoms of a generalized infection. On admission the blood culture was found positive for Staphylococcus aureus. In addition to six transfusions, eight injections of staphylococcus anatoxin were given. In the first two injections 1 cc. was employed, but in each of the six others 2 cc. was given. In spite of secondary complications, such as a pneumonia of the base of the left lower lobe and septic arthritis of the knee, recovery ensued. The first negative blood culture was six weeks after admission to the hospital, five of the six previous blood cultures having been positive.

Prof. René Leriche Lecturer at College de France

Owing to the death of Prof. Charles Nicolle, two lectures a week are being given by Prof. René Leriche of Strasbourg, who has chosen as his subject the "Surgery of Pain." This is a subject to which Professor Leriche has devoted the greater part of his experimental research during recent years. His clinical work on the surgery of the sympathetic system is familiar to American surgeons.

Professor Leriche is at present head of the department of surgery in the medical school at Strasbourg. He has as predecessors in the College of France such distinguished men as Laënnec, Magendie and Claude Bernard.

Professor Nobécourt Promoted in Legion of Honor

February 15 the friends and assistants of the pediatrician Professor Nobécourt presented him with a medal on his recent promotion to the rank of Commander in the Legion of Honor. The meeting was held in the lecture room of the Hôpital des enfants malades and the services rendered to the development of pediatrics were described by Surgeon General Rouvillois, president of the Académie de chirurgie.

Antoine Béclère's Eightieth Birthday

The friends and students of the roentgenologist Antoine Béclère presented him with a medal and a book containing a summary of his contributions to his specialty on March 17, his eightieth birthday. Professor Béclère is still very active in hospital work and frequently attends medical meetings.

BERLIN

(From Our Regular Correspondent)

Feb. 26, 1936.

Discussion of Diabetes

Important problems in the field of diabetes were recently discussed by the Berlin Medical Society. Professor Umber, the first speaker, is of the opinion that in diabetes a disturbance in the absorption of sugar in all the organs as well as the disturbance of the formation of glycogen is to be considered. This hypothesis is supported by the effect of insulin therapy, which increases the absorption of carbohydrate by the body. In 98 per cent of the cases of diabetes it is a question of damage to the islands of Langerhans, while but 2 per cent present extra-insular hyperglycemia. In cases of insular insufficiency, the cases of "true diabetes," reaction to insulin is favorable whereas extra-insular glycosuria is not influenced by diet or by treatment with insulin. Umber concludes that the mutual hereditary predispositions toward diabetes in a pair of twins result in identical manifestations of the insular type disease, while dissimilarity can be caused only by infections, neglect of the insulin supply and so on. Allen's treatment when not too prolonged is still highly efficacious. Since continued secretion of sugar, indicative of a high sugar content in the blood, influences the course of the disease most unfavorably, Umber stipulates that in cases of insular diabetes the urine be free from sugar. The maintenance of a normal blood sugar content is necessary, however, only if an operation is contemplated; otherwise it may safely be kept at not above 200 mg. per hundred cubic centimeters. The necessity for insulin therapy should be determined by the remaining amount of insulin produced and by the number of calories supplied. One may attempt to replenish the deficient glycogen supply in the liver and musculature of diabetic patients, under the protection of insulin perhaps, by a regimen rich in carbohydrate and deficient in fat. In mixed cases of insular and extra-insular diabetes the hope of effecting a favorable influence over the disease by the establishment of slightly soluble deposits of insulin has not been realized. These cases cannot, need not, be kept free from sugar.

C. Brentano of the von Bergmann clinic pointed out that the skeletal musculature is the greatest consumer of sugar and accordingly the greatest consumer of insulin within the human organization. The skeletal musculature and not the liver is the true center of metabolic disturbance in diabetes. The distressed glycogen condition tests the organism by increasing the blood sugar in order to facilitate the formation of sugar and acetone bodies. Treatment formerly was directed at the dead cells presenting unabsorbed sugar of the flooded tissue fluid; at present the living cells, deficient in glycogen, and the muscle cells in particular are observed. The organism must be assisted in its struggle to facilitate the formation of glycogen. It is here assumed that a provision of the most important building material of glycogen, the carbohydrate of nutrition, is indicated. With this in mind the attempt should be made to obtain the best possible carbohydrate balance; namely, the greatest possible difference between the amount of carbohydrate ingested as nutriment and the amount of sugar excreted in the urine. The fear of glycosuria is unwarranted; the condition is dangerous only as the balance is deficient. Glycosuria and the blood sugar do not increase in the same measure as the amount of supplied carbohydrate. Improvement of the balance by increased supplies of carbohydrate has, however, its limitation; overfeeding both before and after must be avoided. While from 36 to 60 Gm. of carbohydrate has heretofore been reckoned as sufficient for the diabetic patient, Brentano attempts to maintain balances of from 100 to 250 Gm. in his patients. The replenishment of the depleted glycogen stock takes place

V 106
1936

most rapidly when temporary injections of insulin in increased amounts and a full, free supply of carbohydrate are employed. With this treatment begins a lasting improvement in the patient's metabolism. In serious cases much more carbohydrate is given now than before. A mild accompanying glycosuria is not harmful.

Also observations on diabetes in childhood were made. Umber had stated that, despite the generally severe course taken by the disease, he successfully treated sixty-seven children who were under observation for two years. One other child patient died in coma. The Berlin pediatrician Professor Bessau stressed, however, the unfavorable prognosis when diabetes occurs in childhood. In its earliest stage, childhood diabetes is often accompanied by decrease in the blood sugar. Bessau infers therefrom a defect in the regulating capacity of the pancreas. The nutriment ingested by children undergoing treatment with insulin should amount to 1 Gm. of albumin, 4 Gm. of fat and 6 Gm. of carbohydrate per kilogram of body weight. Any deviation from this proportion has a bad effect on metabolism; reduction of the carbohydrate ration or an increase in fat causes acetonuria. Since fatalities due to hypoglycemic action occasionally occur among children as late as eight hours after the injection, Bessau considers administration of insulin in the afternoon distinctly contraindicated.

The Selection of Secondary School Pupils

Health service for the German secondary schools (gymnasia, realgymnasia, realschulen) came to be regarded as important only following the World War. Decades before the Breslau professor of ophthalmology Hermann Cohn had called attention to the prevalence of myopia, particularly among the secondary school population, and at the same time raised the question of school health in general. Today, by careful selection, all but the mentally and physically fit are refused admission to the secondary schools. In March 1935 the national minister of education decreed that young persons afflicted with presumably incurable disorders which impair the vital forces as well as carriers of hereditary disease shall no longer be accepted in the secondary schools. In doubtful cases official medical opinion must be consulted. Young persons who show a stubborn aversion to cleanliness and those who by nonparticipation in physical exercise exhibit "an unwillingness to achieve physical hardihood" are subject to expulsion unless express recommendation that they be permitted to remain is made by both the official physician and the instructor in athletics. Physical exercise thus receives stronger emphasis than before, although previously it had been possible in case of total failure in sports and calisthenics to withhold the certificate of fitness for the university.

The national minister of the interior has established certain guiding principles that are to be considered authoritative for health supervision in secondary schools. The public health officers are as yet (up to the time of the general rearrangement of the school medical service) responsible for physical examinations of secondary school pupils.

The guiding principles differentiate candidates as completely, conditionally and temporarily unfit for admission.

To the first group belong all those afflicted with mental or physical defects that presumably will later prove obstacles to the proper training for and practice of a profession. Among such disqualifying defects and diseases are badly decompensated heart conditions, severe asthma, chronic kidney disorders, marked defects of the eyes and ears, as well as serious impediments of speech resulting from cleft palate or diphtheric crippling; severe organic nervous defects and similar disturbances of the endocrine system; schizophrenia, the milder types of feeblemindedness and moral delinquency.

Certain diseases classify the candidate as fit on condition, for example epilepsy, manic depressive insanity, psychopathic states, sexual degeneracy and narcotic intoxications. Classified as temporarily unfit are those presenting offensive diseases such as chronic extensive eczema or acute syphilis with cutaneous phenomena, also disturbances that can be easily imitated by others, chorea minor for example; and, finally, ephemeral psychic disturbances that are manifestations of psychoses caused by intoxications, infections or trauma, provided such will not lead to permanent alterations of character.

Jewish and Non-Aryan Physicians in Germany

In the Nuremberg Laws the terms "Aryan" and "non-Aryan" are abandoned and henceforth the differentiation shall be as between Jewish and non-Jewish physicians. The following are classified as Jewish physicians: (1) full Jews (persons descended from four Jewish grandparents), (2) three-fourths Jews (having three Jewish grandparents), (3) half Jews (having two Jewish grandparents) who on Sept. 16, 1935, were members of the Jewish religious community or who subsequently have assumed such membership and, in addition, half Jews who, as of the foregoing date, had contracted marriage with a Jew (or Jewess) or who subsequently have contracted such marriage. All other physicians are collectively classed as non-Jewish.

Non-Jewish physicians must not permit Jewish physicians to serve in their stead nor shall they themselves substitute for Jewish physicians. This rule may be abrogated in exceptional emergency cases by the physicians of the insurance practice. Similar provisions regulate the employment of consultants and assistants. Non-Jewish physicians must refer their non-Jewish patients only to non-Jewish specialists or hospital physicians and vice versa. On the other hand, non-Jewish physicians (in particular, those connected with hospitals and sanatoriums) must receive patients referred by Jewish physicians if the professional circumstances appear to warrant such action. Consultants are under the same obligation. This provision is designed primarily to aid persons entitled to government insurance benefits (sick insurance, invalid insurance and so on).

The new regulation in no way changes the nonadmittance to practice of new physicians of non-Aryan descent and those Aryan physicians who are married to non-Aryans. These have not been admitted to the insurance practice since May 17, 1934. They will not be allowed to practice (as the reichsärzteordnung stipulates) so long as on the date of application for admittance the proportion of physicians of other than German (non-Aryan) blood exceeds that of the non-German citizens to the entire population. As non-German are classified all persons not descended from four grandparents of German (Aryan) blood.

Organization for New "German Medicine"

In April the newly established National Organization for New "German Medicine" (Reichsarbeitsgemeinschaft für eine neue "Deutsche Heilkunde") will hold its three day national convention at Wiesbaden. Among the announced lecture topics the following may be mentioned: "Paracelsian Thought Within the Bounds of New 'German Medicine,'" "Morphologic Foundations of Biologic Thought in Medicine," "Influence of Institutional Treatment on the General Condition and Attitude of the Patient" and "The Clinical Function of Conscience." A layman, Wegener, a member of the Expert Advisory Public Health Council and director of the National Federation of Associations for Life and Therapeutic Method in Conformity with Nature, will discuss "What Relationship Exists Between the Popular Healing Movement and New 'German Medicine'?"

The Congress of Internal Medicine, the first session of which will be held in conjunction with the foregoing organization, will be addressed on similar subjects; for example, "Nature Medicine Within the Bounds of Academic Medicine," "New German Medicine-Physician and Graduate Study," and "Scientific Nature-Medicine."

BUENOS AIRES

(From Our Regular Correspondent)

March 5, 1936.

Antidiphtheritic Vaccination

Dr. Alfredo Sordelli, director of the Instituto Bacteriológico of the National Department of Hygiene, lectured before the Academia Nacional de Medicina of Buenos Aires, Oct. 24, 1935, on results obtained by workers in the institute on the preparation of an antidiphtheritic vaccine from a toxoid activated by aluminum oxide. A single injection of 2 cc. of the vaccine produced immunization in from 93 to 96 per cent of 6,015 children who have been vaccinated. The injection is given in the subcutaneous cellular tissues of the infrascapsular region. Local and general reactions were slight.

Society Reunion

The Sociedad de Patología of the northern region of Argentina at its ninth reunion in Mendoza province, Oct. 1, 1935, discussed the subject of American trypanosomiasis. Homage was paid to the memory of Dr. Carlos Chagas, the discoverer of Schizotrypanum Cruzi. More than thirty cases of American trypanosomiasis have been discovered in Argentina, scattered all over the country. Acute forms of the infestation have been seen in small children. In all cases there were palpebral edema and unilateral conjunctivitis (Romaña's sign) which, probably, is the port of entry of the infestation. Cases of trypanosomiasis in animals have been seen in different parts of the country. Dogs, armadillos, ferrets, foxes and bats are the animals which up to now have been found to be naturally infected.

Disturbances Among Students

There have been some disturbances among the students of the Faculties of Medicine of Buenos Aires and Córdoba. In the faculty of Buenos Aires the students asked for the resignation of two professors. One resigned, as well as the dean and the board of directors. A new directive board was elected and Dr. José Arce was appointed dean of the faculty. The new board of directors asked the other professor to resign and granted all the requirements made by the students. September 10 the dean left for a trip to Chile, Peru, Mexico, the United States and Cairo. In the faculty of Córdoba the students forced the resignation of the professors who represented them before the board of directors of the faculty.

Appointments

Prof. A. Sordelli was appointed a member of the Committee of Hygiene and Public Health of the League of Nations.

Dr. Ernesto Merlo was appointed professor of semeiology at the Faculty of Medicine of Buenos Aires to succeed Dr. C. Bonorino Udaondo, who resigned.

Drs. Julio Diez, L. Rabuffetti and J. Hanon were appointed associate professors of surgery, clinical medicine and clinical neurology, respectively, at the Faculty of Medicine of Buenos Aires.

Institute of Clinical Physics

The senate passed a bill whereby 150,000 Argentine pesos (about $42,000) will be allowed yearly for the upkeep of a national institute of physics applied to human pathology. Dr. Mariano R. Castex has been appointed director.

Professor Houssay Returns

Prof. B. A. Houssay has returned to Argentina after a voyage during which he gave twenty-eight lectures as follows: one in Cambridge, England, three in France, nineteen in the United States, two in Canada and three in Brazil. In the United States he gave the Dunham lectures at Harvard, the Hanna lecture in Cleveland, the Lane lecture in San Francisco, the Herter lecture at Johns Hopkins, the Harvey lecture in New York, the Eastman lecture in Rochester and several other lectures in the University of California, Stanford University, the University of Chicago, the University of Pennsylvania, Yale and the Academy of Medicine of Los Angeles and of San Diego, and the American Association for the Advancement of Science.

Prof. B. A. Houssay was given the honorary degree Doctor honoris causa of the University of Paris, Nov. 9, 1935, in the Sorbonne amphitheater.

Prizes Awarded

Prizes given for the best theses presented during 1934 were awarded to Dr. L. Leloir for his work on suprarenals and metabolism of carbohydrates, Dr. E. Capdehourat for his work on cyanosis in Ayerza's disease, and Dr. E. Braun Menéndez for his work on diencephalon, hypophysis and arterial pressure.

Dr. Julio Diez was recently given the first national prize of sciences for 1931 for his work on surgery on the sympathetics in vascular disturbances. The prize is 30,000 pesos (about $9,500).

Dr. P. Pavlovsky was given the P. Palma prize of 10,000 pesos (about $2,800) for his work on diagnosis by means of ganglionic puncture.

Honors Bestowed

At a public gathering recently in Buenos Aires Dr. A. H. Roffo was rendered homage for his twenty-five years' work in the study of cancer. A plate was unveiled in the Instituto Bacteriológico of Buenos Aires, Nov. 23, 1935, in memory of Prof. R. Kraus, the founder of the institute at its present location. A mural plate was recently unveiled in the Facultad de Medicina of Buenos Aires in honor of Prof. Luis Güemes.

Deaths

Dr. Rodolfo A. Rivarola, associate professor of orthopedics and director of the Hospital de Niños, died, Dec. 5, 1935.

Dr. Pedro B. Aquino, physician of the Hospital Alvear, died, Oct. 12, 1935.

Dr. Francisco de la Torre, professor of therapeutics and ex-dean of the Faculty of Medicine of Córdoba, died, Nov. 17, 1935.

Drs. Fernando Ruiz and Artemio Zeno, professors of pathologic anatomy and of clinical surgery at the Faculty of Medicine of Rosario, died, Nov. 17, 1935.

Dr. S. Madrid Paez, director of the Casa de Expósitos, died, January 16.

Dr. Juan Busco, a well known pediatrician, died, January 26.

Marriages

Oscar Hugh Fulcher, Welch, W. Va., to Mrs. Irene Pendleton Moorman at Princeton, March 3.

Samuel Eugene Miller, Pauline, S. C., to Miss Elizabeth M. Barnwell of Rockville, March 10.

Walter G. Stuck, San Antonio, Texas, to Miss Mary Eleanor Buck of Chicago, March 28.

George A. Fiedler, New York, to Miss Elinor Marie Cummings of Toronto, Ont., March 14.

John A. Simmons, Arcadia, Fla., to Mrs. Erma T. Lambert of Columbia, S. C., February 18.

William Rudolph Hamsa, Iowa City, to Miss Doris Sanborn of Scotia, Neb., recently.

C. Keith Barnes, Williston, N. D., to Miss Margaret Skudstad of Chicago, March 17.

Franz Rene Murad to Miss Priscilla Godfrey Merrill, both of New York, at Bedford, N. Y., in February.

Samuel E. Widney, Lexington, Neb., to Miss Lily E. Willis of Detroit recently.

John M. Russell to Miss Elsie Kloos, both of Youngstown, Ohio, February 27.

V 106
1936

Deaths

Harlow Brooks ● New York; professor emeritus of clinical medicine, New York University College of Medicine, died, April 13, following an operation for abscess of the liver, aged 65. Dr. Brooks was born in Medo, Minn., March 31, 1871. After attending schools at Mapleton, Minn., and the University of Oregon, he went to the University of Michigan Department of Medicine and Surgery, Ann Arbor, where he graduated in 1895. He studied at the University of Freiburg in Germany in 1898 and at the Polyklinik in Munich in 1901. In 1894 he was assistant demonstrator of anatomy at his alma mater. From 1895 to 1898 he was an instructor in histology and embryology at the Bellevue Hospital Medical College, New York, later known as the New York University and Bellevue Hospital Medical College; he was an instructor and assistant professor of pathology and special pathology from 1898 to 1900, assistant professor of clinical medicine from 1904 to 1911, and later professor of clinical medicine. Dr. Brooks served as a captain in the army medical department during the Spanish-American War. In 1917 he served as a major in the World War in command of the Base Hospital at Camp Upton, Yaphank, L. I. In 1918 he was promoted to lieutenant colonel in the United States Army and went to France, where, after serving as chief consultant in medicine to two armies, was appointed chief surgeon of the Second Army, American Expeditionary Forces. He was awarded the Distinguished Service Medal. Since 1919 he had been a colonel in the U. S. Army Reserve Corps.

In 1916 Dr. Brooks was a member of the House of Delegates of the American Medical Association. He was a member of the American Gastro-Enterological Association and the Association of American Physicians, and a past president of the American College of Physicians and formerly vice president of the New York Academy of Medicine. He served also as chairman of the program committee of the Pan-American Medical Association. He was a trustee of the New York Pathological Society and in 1934 honorary police diagnostician of New York City. Dr. Brooks was visiting physician to the City Hospital, consulting physician to the Montefiore Hospital, New York Polyclinic Hospital, Fifth Avenue Hospital, Beth Israel Hospital, Union Hospital and the French Hospital, New York, Ossining (N. Y.) Hospital, Greenwich (Conn.) Hospital, Hackensack (N. J.) Hospital, Mount Vernon (N. Y.) Hospital, St. John's Hospital, Yonkers, and the Beth Israel Hospital, Newark, N. J. He was the author of many monographs and special articles on medical, biologic and ethnological subjects and was interested in animal life, exploration and mountaineering. Honorary fellowship was awarded to him by the New York Zoological Society. In 1929 he was awarded an honorary Master of Science by the University of Michigan. He was much sought as a clinical teacher by many medical organizations. As a worker he was indefatigable and his geniality won him innumerable friendships among his colleagues.

HARLOW BROOKS, M.D., 1871-1936

William Bradley Coley ● New York; Harvard University Medical School, Boston, 1888; widely known for his work and reports on the treatment of sarcoma by means of erysipelas and prodigiosus toxins; formerly professor of clinical surgery, Cornell University Medical College; instructor of surgery, New York Post-Graduate Medical School and Hospital, 1890-1897; clinical lecturer in surgery, Columbia University College of Physicians and Surgeons, 1898-1908, and associate 1908-1909; member of the American Surgical Association, Southern Surgical Association and the Radiological Society of North America; honorary member of the Association of Surgeons of Great Britain and Ireland; honorary fellow of the Royal College of Surgeons of England; fellow of the American College of Surgeons; author of the chapter on hernia in various systems of medicine and surgery; chief surgeon to the Mary McClelland Hospital, Cambridge; consulting surgeon to the Physicians Hospital, Plattsburg, Fifth Avenue Hospital and Memorial Hospital for the Treatment of Cancer and Allied Diseases, New York, and the Sharon (Conn.) Hospital; surgeon in chief emeritus to the New York Society for the Relief of Ruptured and Crippled, where he died, April 16, aged 74, following an operation for an intestinal infection.

Theodore Le Boutillier ● Philadelphia; University of Pennsylvania Department of Medicine, Philadelphia, 1898; formerly clinical professor of pediatrics, Woman's Medical College of Pennsylvania, Philadelphia, and assistant professor of epidemic contagious diseases, University of Pennsylvania Graduate School of Medicine; served during the World War; past president of the Philadelphia Pediatric Society; on the staffs of the Philadelphia General Hospital and the Philadelphia Hospital for Contagious Diseases; aged 59; died, March 4, in the University of Pennsylvania Hospital.

Robert Davies Rhein, Philadelphia; University of Pennsylvania Department of Medicine, Philadelphia, 1901; member of the Medical Society of the State of Pennsylvania; for many years on the staffs of the Howard Hospital, American Hospital for Diseases of the Stomach and the Philadelphia General Hospital; physician to the Home for Incurables; aged 69; died, February 1, in the Graduate Hospital, of coronary thrombosis.

Marcus Polk Smartt, Austin, Texas; University of Dallas Medical Department, 1902; served during the World War; county health officer; formerly director of communicable diseases, state department of health; aged 64; died, February 5, in a local hospital, of pneumonia.

George Washington Williamson, Hartford, Ala.; Medical College of Alabama, Mobile, 1893; member of the Medical Association of the State of Alabama; past president of the Geneva County Medical Society; aged 72; died, January 29, of cardiorenal disease.

Daniel Guy Mills ● McCallsburg, Iowa; State University of Iowa College of Medicine, Iowa City, 1896; for many years county coroner; aged 74; died, January 28, in the Iowa Sanitarium and Hospital, Nevada, of carcinoma of the gallbladder.

Aloys Ibeler, Pittsburgh; Julius-Maximilians-Universität Medizinische Fakultät, Würzburg, Bavaria, Germany, 1925; aged 40; resident physician to St. Francis Hospital, where he died, February 12, as the result of a skull fracture received in a fall.

Ferdinand Wilhelm Vowinckel ● San Francisco; Medizinische Fakultät der Friedrich-Wilhelms-Universität, Berlin, Prussia, Germany, 1885; served during the World War; aged 74; died, February 24, in the University of California Hospital.

Louis F. Ankrim ● Pittsburgh; College of Physicians and Surgeons, Baltimore, 1886; aged 78; died, January 25, in the Western Pennsylvania Hospital, of bronchopneumonia, following fracture of the pelvis due to a fall on an icy sidewalk.

Webster Stanley Smith ● Dayton, Ohio; Medical College of Ohio, Cincinnati, 1880; past president of the Montgomery County Medical Society; aged 79; on the staff of the Miami Valley Hospital, where he died, January 30, of arteriosclerosis.

Murray Morris Levy, Portland, Ore.; University of Oregon Medical School, Portland, 1917; member of the Oregon State Medical Society; clinical instructor in medicine at his alma mater; aged 50; died, January 24, of coronary sclerosis.

William Moran, Portland, Maine; Vanderbilt University School of Medicine, Nashville, Tenn., 1901; member of the Maine Medical Association; formerly on the staff of the Maine Eye and Ear Infirmary; aged 73; died, January 30.

Charles C. McClendon, Galveston, Texas; Meharry Medical College, Nashville, Tenn., 1905; aged 55; died, January 20, in the Los Angeles General Hospital, of coronary thrombosis and diabetes mellitus.

Clayton Elmer Bartlett, Aberdeen, Wash.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1905; aged 55; died suddenly, January 14, of heart disease.

Roddie J. Hamilton, Springfield, Ky.; University of Louisville (Ky.) Medical Department, 1891; member of the Kentucky State Medical Association; aged 68; died, January 25, of cerebral hemorrhage.

Jefferson T. Novinger, Westmount, Que., Canada; Hahnemann Medical College and Hospital, Chicago, 1903; formerly on the staff of the Homeopathic Hospital, Montreal; aged 58; died, January 20.

Robert Samuel Frost, Kinmount, Ont., Canada; M.D., Victoria University Medical Department, Coburg, 1881; M.B., University of Toronto Faculty of Medicine, 1882; aged 83; died, January 24.

Arley Ernest Carlock, Hartshorne, Okla.; Missouri Medical College, St. Louis, 1897; member of the Oklahoma State Medical Association; aged 62; died, January 10, of coronary thrombosis.

Guy Huffman Rothfuss, Williamsport, Pa.; New York University, University and Bellevue Hospital Medical College, 1933; aged 31; was killed January 30, in a railroad accident in Sunbury.

Robert H. Greene, Hagerman, Idaho; St. Louis College of Physicians and Surgeons, 1896; member of the Idaho State Medical Association; aged 71; died, January 21, of paralysis agitans.

Lewis W. Watkins, Leonard, Texas; Memphis (Tenn.) Hospital Medical College, 1903; aged 60; died, January 5, in the Baylor University Hospital, Dallas, of bronchopneumonia.

Carolus Melville Cobb, Lynn, Mass.; University of Vermont College of Medicine, Burlington, 1883; member of the Massachusetts Medical Society; aged 74; died, January 2.

Francis Joseph Meek, Shamokin, Pa.; Jefferson Medical College of Philadelphia, 1892; member of the Medical Society of the State of Pennsylvania; aged 68; died, January 24.

Willie Paxton Holloway, Maud, Texas; Memphis (Tenn.) Hospital Medical College, 1912; served during the World War; aged 49; died, February 13, of cerebral hemorrhage.

David Wenger Enaminger, Mount Aetna, Pa.; Hahnemann Medical College and Hospital of Philadelphia, 1902; aged 73; died, January 15, of chronic myocarditis.

Martin L. Brodie, Corinth, Ky.; University of Tennessee Medical Department, Nashville, 1889; aged 77; died suddenly, January 23, of myocarditis and arteriosclerosis.

Henry Carlyle Randle, Portland, Ore.; Willamette University Medical Department, Salem, 1907; aged 60; died, January 19, of myocarditis and aortic insufficiency.

Robert Scrivner Lipscomb, Grapevine, Texas; Tulane University of Louisiana Medical Department, New Orleans, 1888; aged 76; died, January 26, of pneumonia.

William Harvey Clarke, Fruitdale, Ala.; Medical College of Alabama, Mobile, 1894; aged 70; died, January 28, in the Mobile (Ala.) Infirmary, of pneumonia.

Morgan Wilson Knerr, Coplay, Pa.; Bellevue Hospital Medical College, New York, 1891; aged 71; died, January 13, of prostatic hypertrophy and uremia.

Abraham Moss, Brooklyn; Cornell University Medical College, New York, 1903; formerly on the staff of the Broad Street Hospital; aged 53; died, January 19.

Allen J. Trail, McMinnville, Tenn.; University of Tennessee Medical Department, Nashville, 1895; aged 75; died, January 19, of coronary thrombosis.

Thomas Jefferson Dodson, Foss, Okla.; University of Tennessee Medical Department, Nashville, 1891; aged 73; died, January 13, of chronic myocarditis.

William Cannon Cahall, Philadelphia; Jefferson Medical College of Philadelphia, 1879; aged 78; died, January 24, in Allenwood, Pa., of tuberculosis.

John G. Sharp, Francis, Okla. (licensed in Oklahoma under the Act of 1908); member of the school board; aged 64; died, January 10, of angina pectoris.

Alexander Allen Forbes, North Vancouver, B. C., Canada; University of the City of New York Medical Department, 1883; aged 85; died, Dec. 4, 1935.

Jesse J. Fouts, Gonzales, Texas; Tulane University of Louisiana Medical Department, New Orleans, 1888; aged 77; died, January 15, of uremia.

Irving Harold Blue, Sanford, N. C.; Meharry Medical College, Nashville, Tenn., 1924; served during the World War; aged 39; died, January 23.

Bernard P. Garred, Charleston, W. Va.; College of Physicians and Surgeons, Baltimore, 1883; aged 77; died, January 19, of coronary occlusion.

Thomas P. Crawford, East Liverpool, Ohio; University of Wooster Medical Department, Cleveland, 1877; aged 85; died, in January, of senility.

William A. Hall, Prairie Du Chien, Wis.; Louisville (Ky.) Medical College, 1877; aged 85; died, January 27, of pyelonephritis and uremia.

George Louis Marion, Mountain View, Calif.; Rush Medical College, Chicago, 1886; aged 70; died, January 22, of coronary thrombosis.

Alcinda Auten Pine, South Pasadena, Calif.; Woman's Medical College, Chicago, 1882; aged 77; died, January 19, of chronic myocarditis.

John Samuel Gale, Tampa, Fla.; University College of Medicine, Richmond, Va., 1907; aged 53; died, January 16, of coronary occlusion.

William E. Mack, Paradise, Calif.; Cincinnati College of Medicine and Surgery, 1884; aged 79; died, January 31, of chronic myocarditis.

Abigail Grace White, Bradford, Pa.; Homeopathic Hospital College, Cleveland, 1887; aged 82; died, January 13, of chronic myocarditis.

Louis Lynn Walls, Los Angeles; Chicago College of Medicine and Surgery, 1910; aged 60; died, January 26, of coronary occlusion.

Robert Dunn, Davis, Okla.; Southwestern University Medical College, Dallas, 1904; aged 55; died, January 19, of coronary occlusion.

Robert M. Drummond, Russellville, Ark.; Vanderbilt University School of Medicine, Nashville, Tenn., 1881; aged 79; died, January 14.

James Fulton Burnam, Madison, Ala.; University of Nashville (Tenn.) Medical Department, 1899; aged 59; died, January 1, in Huntsville.

Louis Prentiss Bethel, Columbus, Ohio; Cleveland Medical College, 1892; also an orthodontist; aged 76; died, January 17, of heart disease.

Robert Carroll Hiscock, Kingston, Ont., Canada; Queen's University Faculty of Medicine, Kingston, 1900; aged 60; died, January 20.

DeLacy Evelyn Wyman, Lena, S. C.; University of Georgia Medical Department, Augusta, 1900; aged 59; died, January 24.

Gabriel N. Tinsley, Bowling Green, Mo.; Missouri Medical College, St. Louis, 1879; aged 77; died, January 5, of angina pectoris.

George E. Goodwin, Ardmore, Okla.; Baltimore Medical College, 1896; aged 67; died, January 18, of cerebral hemorrhage.

John Alexander Graham ● Barstow, Calif.; Chicago College of Medicine and Surgery, 1915; aged 58; died, January 2.

J. R. Levy, Florence, S. C.; College of Physicians and Surgeons of Chicago, 1894; aged 73; died suddenly, January 21.

Lewis Wetsell Spradling, Athens, Tenn.; University of Nashville Medical Department, 1899; aged 68; died, January 1.

Harry M. Pierce, St. Petersburg, Fla.; St. Louis Medical College, 1887; aged 74; died recently of cardiovascular disease.

Otho D. Porter, Bowling Green, Ky.; Meharry Medical College, Nashville, Tenn., 1894; aged 71; died, January 21.

Richard Stillwell Holman, St. Louis; Bellevue Hospital Medical College, New York, 1882; aged 77; died, January 7.

Henry Albert Zinninger ● Hartville, Ohio; Starling Medical College, Columbus, 1892; aged 72; died, January 20.

Oran Cortez Holt, San Antonio, Texas; Illinois Medical College, Chicago, 1903; aged 53; died, January 24.

Herbert J. Stevens, Titusville, Fla.; Ohio Medical University, Columbus, 1893; aged 65; died, January 3.

Abram Smith Dyer, Tell City, Ind. (licensed in Indiana in 1897); aged 85; died recently.

V 106
1936

Correspondence

NERVOUS COMPLICATIONS FOLLOWING SPINAL ANESTHESIA

To the Editor:—Some comment is necessary on the article on nervous complications following spinal anesthesia by Brock, Bell and Davison, which appeared in THE JOURNAL, February 8.

There are several statements that to me are basically not quite accurate. The first sentence in the paragraph headed "Comment" reads "In all but one of these cases the cocaine derivative used was well known; two received a preparation of procaine with strychnine sulfate, three nupercaine and one procaine hydrochloride.". This sentence is inaccurate. Procaine hydrochloride and nupercaine are two entirely different chemical compounds and neither is derived from cocaine.

Further along, they state: "In all of the cases but one, the neural syndromes so speedily followed the administration of the spinal anesthesia as to suggest immediately a direct chemotoxic effect of the cocaine derivatives on the neuraxis. It must be emphasized, however, that the direct toxic effect does not entirely explain the causation of the neural complications." It is difficult to understand how the writers can speak of the chemotoxic effect of the cocaine derivatives when, in fact, they are dealing with three different chemical compounds.

In the closing paragraph, the authors state, "it should be noted that allergic factors are not involved in these cases, since one is not dealing with protein sensitization. . . ." I fear the possibility of an allergic factor is too lightly dismissed and why the authors do not recognize that substances other than protein may be responsible for an allergic reaction I am at a loss to understand.

A. L. SCHWARTZ, M.D., Cincinnati.

ELECTROCARDIOGRAPHIC STUDIES DURING ANESTHESIA

To the Editor:—In the discussion on the article entitled "Electrocardiographic Studies During Surgical Anesthesia" (THE JOURNAL, February 8, p. 434) occur the words "even though ventricular fibrillation has not been demonstrated in man. . . ." Perhaps some words have been deleted and Dr. M. J. Raisbeck did not intend to make his statement so final. The chapter on ventricular fibrillation in my book (The Heart in Modern Practice, ed. 2, 1928) contains a reproduction of an electrocardiogram in a patient and references to various reports in the literature; additional articles regarding the occurrence of this arrhythmia have appeared in subsequent medical journals.

The electrocardiogram figure 5, record C, in the article appears to depict a transition to paroxysmal tachycardia, of ventricular origin, with alternation in the direction of the ventricular deflections. This is more dangerous than the mere occurrence of extrasystoles. I have discussed its significance elsewhere (Ventricular Fibrillation Following Ventricular Tachycardia, *Boston M. & S. J.* **190**:687 [April 24] 1924). In brief, the literature of cardiology contains articles on these subjects.

WILLIAM D. REID, M.D., Boston.

[A copy of Dr. Reid's communication was submitted to Dr. Raisbeck, who replies:]

To the Editor:—The point in this comment is well taken and represents my own opinion in the matter. I should have said that ventricular fibrillation "has only rarely been demonstrated in man."

In the course of this impromptu discussion I wished to emphasize the fact that ventricular tachycardia is closely related to ventricular fibrillation and that in the state of our present knowledge ventricular fibrillation ends fatally in the vast majority of cases. I am well aware of the reports in the literature concerning recurring attacks of ventricular fibrillation which have been recorded and followed by recovery, in the sense that the mechanism reverted to normal.

There will probably be an analogy here in the change of opinion concerning auricular fibrillation. It was a common belief that auricular fibrillation persisted indefinitely when once started until more frequent records brought home the fact that the paroxysmal type is far more common than we originally suspected. In the future we may by dint of frequent records be able to demonstrate an increasing number of cases of ventricular fibrillation followed by recovery.

The fact remains that my statement as printed was incorrect and I accept the correction gladly.

MILTON J. RAISBECK, M.D., New York.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted on request.

TOXICITY OF DINITROPHENOL

To the Editor:—I am writing concerning one of my patients, who has become poisoned by taking dinitrophenol tablets at the advice and under the direction of her druggist. The patient is a woman, aged 28, and married. The weight is 177 pounds (80 Kg.), temperature 98.6, pulse 100, respiration 40. About Jan. 1, 1935, she purchased 1 grain (0.065 Gm.) dinitrophenol tablets. Her druggist told her to take one tablet three times a day and to watch for an elevation of temperature, and, if this occurred, to stop the tablets for a while. Several times she noted that her temperature would rise and she would stop taking the tablets for a day. When the temperature again became normal she would resume taking the tablets, sometimes taking 2 grains (0.13 Gm.) three times a day to make up for the lost time. The daily dose varied from 3 to 6 grains (0.2 to 0.4 Gm.). After taking a total of 100 grains (6.5 Gm.) as a first course she noted a small fibrous tumor growing under the mucous membrane of the left lower eyelid. It was also noted at this time that she was having difficulty in seeing objects clearly for an hour or so after awakening in the morning. Observing these symptoms, she decided to stop the tablets. After a lapse of three weeks she resumed the taking of dinitrophenol and consumed 150 one grain tablets at the rate of 3 grains a day. This made a grand total of 250 grains (16.25 Gm.) of dinitrophenol which this patient has taken. She states that she has not taken any since August, at which time I first saw her and advised her to stop. A few days ago she again visited me saying that she was very nervous, had had several fainting spells during the summer, and had attacks when her face would become very flushed and she would become quite warm. Her hair is becoming loose and is falling out rather rapidly. Three weeks ago the lower left second molar tooth began to crumble and is now almost entirely gone except for the roots. The tumor under the mucous membrane of the left eyelid is a little larger. She cannot sleep well at night although she is tired almost all the time. She has noted a partial suppression of urine and is able to retain it for one and one-half days and then passes only a small amount. The urine is normal in color and negative for sugar and albumin. I have read three reports in THE JOURNAL in which death occurred rather quickly but have been unable to find much on the treatment of the condition. I would appreciate any information you have on treatment. I should like to have details of the Derrien test of the urine. Do you think these symptoms and pathologic changes could appear after the drug had been discontinued for two months? What is the prognosis? Has the minimum lethal dose been determined for human beings? I see in THE JOURNAL that the minimum lethal dose for animals is 3 mg. per kilogram.

J. S. CALDWELL, M.D., Cincinnati.

ANSWER.—In view of the nature and variety of harmful effects of dinitrophenol that have been and continue to be reported in the literature, there is no reason for doubting that the patient is suffering from the after-effects of this drug, even though its administration was stopped two months ago. The prognosis should be cautious, since the patient probably sustained severe damage to the liver and kidneys from which she is apparently slow in recuperating. At our present state of knowledge of the toxicology of dinitrophenol it is difficult to interpret the symptoms of which the patient is now complaining. A basal metabolism and a liver function test at this time might be informative.

The minimum lethal dose of dinitrophenol for animals is supposed to range from 20 to 30 mg. per kilogram of body weight. As little as 10 mg. per kilogram, however, is con-

sidered to be too dangerous for routine use in man. The dose recommended for human beings by the protagonists of the drug is 5 mg. per kilogram. However, at least one person out of seven is sensitive to the material and cannot tolerate even much smaller amounts than the recommended dosage. Even the greatest dose that the patient took (6 grains × 60 = 360 mg.), for instance, is below the recommended level (80 Kg. × 5 = 400 mg.).

For a recent summary and bibliography on this subject, the inquirer is referred to the report of the Council on Pharmacy and Chemistry in THE JOURNAL, July 6, 1935, page 31.

Derrien's test for urine consists in determining the ratio $\frac{\text{Formaldehyde nitrogen}}{\text{Hypobromite nitrogen}}$. The nitrogen determined by the formaldehyde method represents chiefly the ammonium salts and also amino acids, if any of the latter are present. The nitrogen determined by the hypobromite method represents chiefly urea. The normal value of this ratio varies around 6:100, depending somewhat on the diet and on the individual. The ratio is raised by acid ingestion, in the acidosis of starvation or hyperemesis gravidarum, in diabetic ketosis and in hepatic insufficiency. The ratio is lowered by an alkali residue diet or alkali administration, and in acidosis of renal origin. A discussion of the interpretation of this test may be found in the *Montpellier médical* 8:34 (June 15) 1934.

RUBBING LINIMENT

To the Editor:—As a camp surgeon in a CCC camp, it has been necessary for me to find a good rubbing liniment for the many aches and pains of the boys. I have been making it up as a grand melange of soap, water, alcohol, turpentine, ether and chloroform. The only trouble is that there is very little heat in the mixture. I attempted to make up a compound mustard liniment according to the Epitome of the U. S. P. and N. F. Although instructions read for oil of mustard 3 per cent, I used an ounce (30 cc.) of synthetic oil of mustard to a quart (liter) of a mixture of 300 cc. of castor oil and 700 cc. of 90 per cent ethyl alcohol, the resulting mixture did not have any heat in it. I then put a drop of the synthetic oil of mustard on my skin and I got only a faint sensation of heat. You will notice that I left out mesereum, menthol and camphor because I felt that the principal thing was the oil of mustard and vehicle. Feeling that the trouble was in the so-called oil of mustard, I spoke to the local druggist who had sold it to me. He got another bottle of the oil and made the liniment up in the proper proportions except that he did not put in fluidextract of mesereum, as he did not carry it and I did not want to put him to extra expense. The result was the same as before. In view of the fact that this is supposed to be the most powerful mixture of all and since the omission of mezereum did not explain the failure, I am writing to you. If published, kindly omit name. M.D., Virginia.

ANSWER.—It is an error to omit the fluidextract of mesereum, as it adds decidedly to the stinging effect of the liniment. One might, if it is desired to make the preparation still "hotter," double the quantity of the volatile oil of mustard.

A preparation made by extracting powdered capsicum, say 10 per cent, with red oil of camphor is reported to be similar to the proprietary liniment.

INTRA-UTERINE PRESSURE DURING LABOR PAINS

To the Editor:—I am interested in obtaining information regarding intra-uterine pressure during labor pains. M.D., New York.

ANSWER.—Schatz (*Arch. f. Gynäk.* 3:58, 1872) recorded the changes in intra-uterine pressure during the process of delivery. He introduced a colpeurynter balloon into the uterus, filled the balloon with water and connected it by means of a tube with a T-cannula, which in turn was connected with two mercury manometers. One manometer recorded the uterine contractions on the drum of the kymograph and the other one helped in the standardization of the pressure values.

Several years later Poullet (*Arch. de tocologie*, February 1880) constructed the so-called tocograph, an instrument that called for the introduction of a bag into the uterus as well as into the rectum. Other methods were devised by Polaillon (*Arch. de physiol.*, 1880, n. 1), Acconci (Sulla contrazione e sull'inerzia dell'utero, Turin, 1891), Dähnhoff (*Arch. f. Gynäk.* 42:335, 1892) and Westermarck. Literature on these methods is cited in Westermarck's article on page 332 of the *Skandinavisches Archiv für Physiologie*, volume 4, published by Veit & Co., Leipzig, in 1893.

Westermarck in 1893 pointed out the disadvantages of the methods reported by Schatz and Polaillon. He devised a new method, which employs a uterine catheter and a bag. The catheter permits the introduction of the bag into the uterus and also forms the connection between the bag and the tube that connects the instrument with the manometer. The catheter makes it possible to fill the bag with water outside the uterus. The catheter must be pliable so that it will lie close to the head of the child when the head passes through the pelvis but should of course not be so soft as to permit compression of its lumen. The Westermarck catheter is 37 cm. in length and made of silver, with an internal diameter of 3 mm. and with the external end closed with a stopcock. Externally to the stopcock is a screw thread, which connects the catheter with the tube that leads to the manometer. The entire system is filled with water, which should contain no air bubbles. The author describes the conduction system that connects the uterus catheter with the manometer and the registration apparatus. He conducted tests with the apparatus. He reviews the cases and gives tabular reports of the results of the measurements, expressed in milligrams of mercury taken at five second intervals. At the beginning of the labor pain the pressure as thus recorded was usually around 20 mm. of mercury. The maximal pressures varied greatly up to 168 mm. of mercury. Westermarck also records the pressures during the intervals between pains and the duration of the pains. His observations indicated that the pressure of the labor pains increases as the process of delivery advances and reaches the maximum at the end of labor.

In the literature of recent years, new methods have been described for the graphic recording of the contractions of the parturient human uterus. Because the intra-uterine methods of registration were complicated and not without danger of infection, external hysterographic methods were devised. Crodel (*Ztschr. f. Geburtsh. u. Gynäk.* 97:138, 1930) described a method of tocergometry. Crodel's method was employed also by E. Frey and Doris Wenner (*Arch. f. Gynäk.* 153:447 [Feb. 22] 1933; abstr. THE JOURNAL, May 20, 1933, p. 1648). Frey (*Zentralbl. f. Gynäk.* 57:548 [March 11] 1933) devised a hysterotonograph and S. M. Dodek of Cleveland has described a method of external hysterography (*Surg., Gynec. & Obst.* 58:45 [July] 1932).

Temesvary of Budapest introduced in 1932 a method of proctotocography. He introduces a metreurynter into the rectum (*Zentralbl. f. Gynäk.* 56:130 [Jan. 16] 1932; abstr. THE JOURNAL, April 2, 1932, p. 1235).

K. Podleschka of the German University in Prague has described a method of cystotocography (*Arch. f. Gynäk.* 153:159, 1932). He registers the pressure of labor pains by measuring the pressure that becomes manifest in the urinary bladder. Following are some additional references to the subject:

Landrieu, V. R., and Leroque, Jean: *Bull. méd., Paris* 48:658 (Oct. 27) 1934.

Scarpini, Corrado: *Ann. di ostet. e ginec.* 55:1819 (Nov. 30) 1933.

Kreis, M. J.: *Bull. Soc. d'obst. et de gynéc.* 22:331 (April) 1933.

USE OF COD LIVER OIL BY PROETZ DISPLACEMENT METHOD IN SINUSITIS

To the Editor:—Please give me information on the value of the instillation of cod liver oil into the sphenoid and ethmoid sinuses by the Proetz displacement method for the treatment of a chronic sinus infection of very long standing. I have recently tried this method of treating my own sinusitis, using Squibb cod and halibut liver oil. The improvement has been rather marked. Over the last four years almost every other method outside of operation has been tried without any apparent improvement. M.D., Pennsylvania.

ANSWER.—The use of cod liver oil in the treatment of sinusitis by any method is new, although other oils have been used with success. Apparently the action is merely one of lubrication, as liquid petrolatum serves as well as the other oils employed in these cases. Thus, Proetz says:

"The effectiveness of lubricants in relieving sinus irritation and its attendant headaches was brought to my attention by Granger, who describes a case in which there was continuous headache day and night for four weeks, and which disappeared promptly and completely following an injection of lipiodol for diagnosis. Potts cites the case of a woman with a headache of several weeks' duration who was similarly relieved. I have since encountered instances of this nature and attribute the relief to the lubricating properties of the lipiodol rather than to any intrinsic therapeutic action of this oil (which is inert, at least with respect to its iodine content), because like results have followed the administration of simple liquid petrolatum of low specific gravity. It is not unlikely that the headaches in these instances were due to the inspissation and possibly the contraction of the secretions in sensitive locations, or to the drying of the membrane itself through unequal ventilation, and that the oil relieved them by simple lubrication. One may employ the light liquid petrolatum referred to, or some simple oily solution, such as the familiar phenol-iodine-petrolatum combination (phenol 0.06 Gm., iodine 0.01 Gm., petrolatum 100 Gm.). The latter is especially helpful in ozena. The bland vegetable oils are equally effective, provided that there is no

V 106 1936

individual sensitivity to them. They have the disadvantage of becoming rancid."—Proetz, A. W.: The Displacement Method of Sinus Diagnosis and Treatment, St. Louis, Annals Publishing Company, 1931, p. 59.

BRITTLE FINGER NAILS

To the Editor:—A well nourished spinster, aged 50, complains of brittle finger nails, which detract from the appearance of her hands. She is of a nervous temperament but does not bite her nails. Her home life is unpleasant, as her parents are semi-invalids and somewhat tyrannical. She has servants and does not have to do any work that requires immersion of her hands in water. I noticed a beauty article which advised immersing the finger tips in warm olive or almond oil at night, and also a high calcium diet. Is there any scientific backing for these measures, or is there anything else that might be of help in this case? The patient appears to be in good health otherwise and has a negative history. Kindly omit name and address.

M.D., Illinois.

ANSWER.—Brittle finger nails may be dependent on local causes that produce excessive dryness of the nail plate, such as nail polishes, polish removers and strong soaps. The constitutional causes in otherwise healthy persons are obscure. As in any condition of the skin or appendages associated with dryness, the application of bland oils is beneficial. The internal administration of calcium, with associated vitamin therapy (vitamins A and D) is also of benefit in cases resistant to local measures.

SENSITIVITY TO TETANUS ANTITOXIN

To the Editor:—Does the administration under an ether anesthetic of tetanus antitoxin to a hypersensitive individual eliminate the danger of anaphylaxis and the necessity of desensitization? Please omit name and address.

M.D., Maryland.

ANSWER.—In spontaneous sensitiveness to horse emanations and horse protein, ether anesthesia could not be relied on to prevent acute anaphylactic shock following the injection of tetanus antitoxin. In sensitiveness due to previous injection of horse serum, ether anesthesia might appear to delay or mask to some extent the possible immediate reaction that might follow reinjection of horse serum.

NURSING BY SYPHILITIC MOTHER

To the Editor:—Proper antisyphilitic treatment was begun in a pregnant woman with a 4 plus Wassermann reaction during her second month of pregnancy. A normal child was born. The blood Wassermann reaction of the child was negative at birth and at 1 month and 3 months. Can the mother breast feed the child without fear of infecting the child with syphilis through the milk? The mother, of course, is still under antisyphilitic treatment. Her blood Wassermann reaction is still 4 plus. Please do not publish name.

M.D., New York.

ANSWER.—The mother may safely nurse the baby as long as she is under adequate treatment.

BELCHING

To the Editor:—What is the best preparation to use for patients who complain of frequent belching of gas, even after drinking water? Please omit name.

M.D., Michigan.

ANSWER.—Patients complaining of frequent belching should be given the benefit of a thorough examination, including gastric analysis, gallbladder visualization and gastro-intestinal investigation. If no organic disturbance is found, a diet should be prescribed avoiding the highly seasoned, greasy and fried foods, and either alkaline powders or dilute hydrochloric acid may be given after meals. Occasionally patients are "air swallowers" and one must be careful to caution them against continuation of this habit.

PHOTOGRAPHIC CYSTOSCOPES

To the Editor:—I am anxious to take some photographs of the inside of the urinary bladder. I have attempted unsuccessfully to use a Leica camera held close to the cystoscope. I will appreciate any information that you may have on this subject or suggestions where I can find it.

M.D., Pennsylvania.

ANSWER.—There are many different makes of so-called photographic cystoscopes. Any medical instrument house can supply information.

DERMOGRAPHISM

To the Editor:—A man, aged 23, has no abnormalities so far as I can find except marked dermographism. This is so noticeable that it is very embarrassing for him. Would you please advise a plan of treatment? Please omit name.

M.D., Oregon.

ANSWER.—The treatment of dermographism is apt to be disappointing. The subject was discussed in THE JOURNAL, Aug. 3, 1935, page 386.

APICAL ABSCESSES OF TEETH

To the Editor:—Under Queries and Minor Notes in THE JOURNAL, January 4, a physician asks what should be done about several asymptomatic apical abscesses discovered by roentgenograms in an apparently healthy person. In your reply you question the proof of apical abscess based wholly on a radiolucent area about the apex of a tooth but you accept the term apical abscess, which is commonly a misnomer as implying rarefaction of bone about a pulpless or devitalized tooth and is not usually an abscess in the accepted sense of the word.

Then you proceed to say what should be done after a correct diagnosis has been made by "roentgenograms, direct observation and clinical history." Direct observation and clinical history often throw no light on the diagnosis of asymptomatic pulpless teeth. And all this seems of little import when our chief aim is to discover by roentgenograms the presence or absence of pulpless teeth, pyorrhea and other conditions apart. In questionable cases of pulpless teeth in which the pulp canal has not been filled, the vitality should be tested by heat and cold and the electric current. Granted a correct diagnosis of a devitalized tooth, what shall be done about it? Devitalized or pulpless teeth are almost invariably infected ultimately, as shown by the innumerable and painstaking experiments of Rosenow and others, and are always a menace to health. But you go on to state that a cure of pulpless teeth is possible without extraction and that "the clinical and laboratory history in thousands of such cases have shown that such conditions [pulpless teeth] can be cured and the patients remain permanently well in more than 70 per cent of cases."

This, taken literally, is an untenable statement. How is it possible to know that such conditions are cured without extraction of the teeth and taking cultures of them after treatment? But the truly extraordinary assertion is that 70 per cent of thousands of persons remain permanently well by this treatment. Do any persons remain permanently well after any treatment whatever? It would pay adults to have their teeth devitalized if they could thereby achieve such a percentage of permanent health by this treatment. If there is any treatment (except extraction) by which a devitalized tooth may be restored to vitality it is as yet unknown. The failure to describe this marvelously successful form of cure of devitalized teeth is an inexplicable omission. The treatment presumably consists of either the resection of the apex of the pulpless tooth or the complete filling of the supposedly sterilized pulp canal. Neither of these methods prevents future infection of devitalized teeth, as proved by the exhaustive researches of Rosenow and others, since infection arises from the blood stream owing to the lowered resistance of the infected structures about the devitalized or pulpless teeth. Moreover, the oldest clinicians have found by experience that devitalized teeth, however skilfully treated, not infrequently become a source of infection.

Three points I wish to stress: 1. The term apical abscess is usually incorrect. The condition so called is ordinarily (not always) not an abscess as affecting chronic, asymptomatic pulpless teeth but roentgenologically refers to rarefaction of bone from infection of devitalized or pulpless teeth. 2. The degree of hazard to which the patient is subjected cannot be determined by roentgenograms. Thus so-called large apical abscesses, particularly menacing to the roentgenologist, may be less dangerous to health from old walled-in infection than what may be taken as a normal roentgenogram of a completely filled devitalized tooth. 3. The treatment of devitalized teeth other than by extraction is fallacious and does not prevent future infection.

But it does not follow that pulpless or devitalized teeth should be extracted as soon as discovered. That is a matter that must be left to the experienced practitioner who understands that the presence of a pulpless tooth in the mouth is always a potential menace to the human.

This subject is of extreme importance, as nearly 90 per cent of adults have pulpless teeth and the chief resource of the modern practitioner in a vast number of chronic disorders susceptible of alleviation is the removal of focal infections. Among these, devitalized or pulpless teeth are probably the most important and frequent.

KENELM WINSLOW, M.D., Seattle.

APPLICATION OF X-RAYS IN CANCER OF THE BREAST AND TO THE OVARIES

To the Editor:—I read with some surprise in THE JOURNAL, March 14, page 944, in Queries and Minor Notes, the remarks under the heading of "Application of X-Rays in Cancer of the Breast and to the Ovaries." In your answer to the letter asking for information you state that "roentgen therapy to the ovaries has no place in cases of cancer of the breast." This would seem to me rather dogmatic. In 1896 Beatson advocated removal of the ovaries as a palliative measure in the treatment of cancer of the breast. Several articles on the subject have appeared recently based on a more careful and scientific study of the relation of the ovaries to the breast. In December 1924 Taylor published a paper in the *New England Journal of Medicine* (192:1138) reviewing the literature. In his conclusions he states that "radiation castration following radical operation may inhibit or postpone the development of metastasis." He gives a good bibliography. The subject is reviewed also in the *New England Journal of Medicine* in the December 1935 issue (213:1202).

In June 1935 Dresser presented a paper before the American Radium Society in which he reported the results of a series of cases of cancer of the breast treated by roentgen castration. The analysis suggests that the treatment was beneficial. This paper is to appear shortly in the *American Journal of Roentgenology and Radium Therapy.*

While much more investigative work is necessary before any authoritative statement can be made, the evidence at present suggests a distinct relation between the ovarian hormones and cancer of the breast and that radiation castration in women before the menopause is a justifiable procedure. We are advocating it in the Tumor Clinic at the Massachusetts General Hospital and at the Collis P. Huntington Memorial Hospital (Cancer Hospital). It is advised also at the State Cancer Hospital at Pondville.

CHANNING C. SIMMONS, M.D., Boston.

Medical Examinations and Licensure

COMING EXAMINATIONS

STATE AND TERRITORIAL BOARDS

ARKANSAS: *Medical (Regular).* Little Rock, May 12-13. Sec., State Medical Board of the Arkansas Medical Society, Dr. A. S. Buchanan, Prescott. *Medical (Eclectic).* Little Rock, May 12. Sec., Dr. Clarence H. Young, 207½ Main St., Little Rock.

CALIFORNIA: *Reciprocity.* San Francisco, May 13. Sec., Dr. Charles B. Pinkham, 420 State Office Bldg., Sacramento.

CONNECTICUT: *Basic Science.* New Haven, June 13. *Prerequisite to license examination.* Address State Board of Healing Arts, 1895 Yale Station, New Haven.

IOWA: Iowa City, June 2-4. Dir., Division of Licensure and Registration, Mr. H. W. Grefe, Capitol Bldg., Des Moines.

KENTUCKY: Louisville, June 10-12. Sec., State Board of Health, Dr. A. T. McCormack, 532 W. Main St., Louisville.

MARYLAND: *Homeopathic.* Baltimore, June 9-10. Sec., Dr. John A. Evans, 612 W. 40th St., Baltimore.

MISSOURI: St. Louis, June 4-6. State Health Commissioner, Dr. E. T. McGaugh, State Capitol Bldg., Jefferson City.

NEBRASKA: *Basic Science.* Omaha, May 5-6. *Medical.* Omaha, June 9-10. Dir., Bureau of Examining Boards, Mrs. Clark Perkins, State House, Lincoln.

OKLAHOMA: Oklahoma City, June 10-11. Sec., Dr. James D. Osborn Jr., Frederick.

NATIONAL BOARD OF MEDICAL EXAMINERS

NATIONAL BOARD OF MEDICAL EXAMINERS. *Parts I and II.* May 6-8, June 22-24, and Sept. 14-16. Ex. Sec., Mr. Everett S. Elwood, 225 S. 15th St., Philadelphia.

SPECIAL BOARDS

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY: *Oral examination for Group A and B applicants* will be held in Kansas City, Mo., May 11-12. Sec., Dr. C. Guy Lane, 416 Marlboro St., Boston.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY: Oral, clinical and pathological examination of all candidates will be held in Kansas City, Mo., May 11-12. Sec., Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh. (6).

AMERICAN BOARD OF OPHTHALMOLOGY: Kansas City, Mo., May 11 and New York, Sept. 26. *All applications and case reports must be filed sixty days before date of examination.* Asst. Sec., Dr. Thomas D. Allen, 122 S. Michigan Ave., Chicago.

AMERICAN BOARD OF ORTHOPAEDIC SURGERY: Kansas City, Mo., May 11. Sec., Dr. Fremont A. Chandler, 180 N. Michigan Ave., Chicago.

AMERICAN BOARD OF OTOLARYNGOLOGY: Kansas City, Mo., May 9. Sec., Dr. W. P. Wherry, 1500 Medical Arts Bldg., Omaha.

AMERICAN BOARD OF PEDIATRICS: Kansas City, Mo., May 9, Albany, N. Y., June 10, Baltimore and Cincinnati in November. Sec., Dr. C. A. Aldrich, 723 Elm St., Winnetka, Ill.

AMERICAN BOARD OF PSYCHIATRY AND NEUROLOGY: St. Louis, Mo., May 8-9. Sec., Dr. Walter Freeman, 1028 Connecticut Ave., Washington, D. C.

AMERICAN BOARD OF RADIOLOGY: Kansas City, Mo., May 8-10. Sec., Dr. B. R. Kirklin, Mayo Clinic, Rochester, Minn.

AMERICAN BOARD OF UROLOGY: Kansas City, Mo., May 8-10. Sec., Dr. Gilbert J. Thomas, 1009 Nicollet Ave., Minneapolis.

Maryland December Examination

Dr. John T. O'Mara, secretary, Board of Medical Examiners of Maryland, reports the written examination held in Baltimore, Dec. 10-13, 1935. The examination covered 9 subjects and included 90 questions. An average of 75 per cent was required to pass. Sixty-six candidates were examined, 50 of whom passed and 16 failed. The following schools were represented:

PASSED	Year Grad.	Per Cent
George Washington University School of Medicine	(1935)	77.5
Georgetown University School of Medicine (1934) 76, 78.2, 78.5, 80.4, 82.3, 82.7, 83.3	(1932)	78.2,
Howard University College of Medicine 76.7, (1935) 82, 88	(1934)	75.3,
Northwestern University Medical School	(1934)	88
Rush Medical College	(1934)	77.5
Johns Hopkins University School of Medicine (1934) 84.8, (1935) 83.9, 87	(1932)	78.8,
University of Maryland School of Medicine and College of Physicians and Surgeons (1934) 93.6, (1935) 80.7, 81, 81.8, 82.8, 85.2, 88.1	(1929)	86.8,
Harvard University Medical School	(1933)	87
University of Nebraska College of Medicine	(1933)	87.4
Columbia Univ. College of Physicians and Surgeons	(1935)	87.7
Long Island College of Medicine	(1934)	81
New York University College of Medicine	(1935)	91
Duke University School of Medicine	(1933)	85.3
Temple University School of Medicine	(1933)	79.8
Meharry Medical College	(1933) 77.9, (1935)	83.7
Queen's University Faculty of Medicine	(1932)	82.3
Rheinische Friedrich-Wilhelms-Universität Medizinische Fakultät, Bonn	(1935)	88*
Regia Università degli Studi di Bologna. Facoltà di Medicina e Chirurgia	(1931)	80.2,*
Regia Università degli Studi di Padova. Facoltà di Medicina e Chirurgia	(1934)	81.6*
Regia Università degli Studi di Roma. Facoltà di Medicina e Chirurgia (1934) 79.1, (1935) 76.2,* 76.4,* 76.6*	(1933)	77.5,
Regia Università di Napoli Facoltà di Medicina e Chirurgia	(1934)	76.2*
Universität Bern Medizinische Fakultät	(1934)	80.3

FAILED	Year Grad.	Number Failed
Georgetown University School of Medicine (1934,2),	(1935)	3
Howard University College of Medicine	(1935)	1
University of Maryland School of Medicine and College of Physicians and Surgeons	(1935)	1
Friedrich-Wilhelms-Universität Medizinische Fakultät, Berlin	(1932)*	1
Hamburgische Universität Medizinische Fakultät	(1924)*	1
Johann Wolfgang Goethe-Universität Medizinische Fakultät, Frankfurt-am-Main	(1933)*	1
Regia Università degli Studi di Palermo. Facoltà di Medicina e Chirurgia	(1929)*	1
Regia Università degli Studi di Roma. Facoltà di Medicina e Chirurgia (1932), (1933), (1934),*	(1935)*	4
Regia Universita di Napoli Facoltà di Medicina e Chirurgia (1923), (1928),*	(1935)*	3

Nine physicians were licensed by reciprocity from October 1 through December 3. The following schools were represented:

LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
College of Medical Evangelists*	(1924)	California
Emory University School of Medicine	(1931)	Georgia
Rush Medical College	(1934)	Michigan
Indiana University School of Medicine	(1921)	Indiana
St. Louis University School of Medicine	(1921)	Missouri
Creighton University School of Medicine	(1929)	Nebraska
Woman's Medical College of Pennsylvania	(1934)	Penna.
Vanderbilt University School of Medicine	(1934)	Tennessee
University of Montreal Faculty of Medicine	(1924)	Quebec

* Verification of graduation in process.

Book Notices

The Human Foot: Its Evolution, Physiology and Functional Disorders. By Dudley J. Morton, Associate Professor of Anatomy, College of Physicians and Surgeons, Columbia University. Cloth. Price, $3. Pp. 344, with 100 illustrations. New York: Columbia University Press, 1935.

The author traces the origin of vertebrate limbs from the protoplasmic primordial forms of organic life. The gradual development of the human foot is presented in an interesting and authoritative manner. The physiology of the foot and the mechanics of weight bearing and locomotion are well described and analyzed. The author states that the great majority of common types of "arch trouble" are caused by accumulative traumatism resulting from uneven weight distribution and faulty movement of stresses through the foot. This gives the average reader something to think about.

By means of two ingenious mechanical devices, the staticometer and the kinetograph, the author shows that the body weight is borne equally on the four lateral metatarsal heads and that the first metatarsal head bears twice as much weight as any one of the lateral heads. He concludes, therefore, that there is actually no anterior transverse metatarsal arch. This corroborates the opinion of some other writers and is probably correct. He emphasizes the importance of "hypermobility of the first metatarsal segment," which means the existence of an unusual amount of motion between the medial and the middle cuneiform bones. He believes that this is demonstrated in x-ray films in certain cases. This hypermobility predisposes the individual to abnormal stresses. An unusual shortness of the first metatarsal bone is another element of importance contributing to abnormal stress in weight bearing, in that it places too much strain on the second metatarsal bone, as evidenced by a definite hypertrophy of the shaft of the second metatarsal. This hypertrophy is well shown in the accompanying roentgenograms, although it does not prove the correctness of the deduction.

Shortening of the gastrocnemius and soleus is an important factor in foot disorders and may be either congenital or acquired. High heeled shoes, and prolonged recumbency during illness, without proper prevention of foot drop, are mentioned as contributing causes. The x-rays are of great importance in the examination of the feet and are too often neglected. The most common reason for the functional disorders among women is the temptation to use the more abusive type of shoes. T. G. Morton's metatarsalgia is not due to the pinching of nerves but "to traumatic arthritis with effusion of the second tarsometatarsal joint, in association with congestion and irritability of the median plantar nerve. The effusion permits a certain amount of abnormal movement between the bones. When these movements occur, a stabbing pain is referred along the nerve." Some orthopedic surgeons might hesitate to accept this explanation, in view of the fact that attacks of Morton's metatarsalgia

V 106 1936

occur only while the patients are wearing shoes. When walking without shoes, no pain is felt. "The symptoms of painful, or clinical, disorder are directly traceable to traumatic cellulitis involving the nerves." This statement, while possibly correct, has not been substantiated by pathologic demonstration, so far as the reviewer is aware.

The book is not a compendium of the disorders of the foot and their treatment. The author has spared his readers any discussion of "athletes' foot." He advocates no new and original operation for bunions. He shows diagrams of only two simple and practical devices to correct improper weight bearing and thus earns the reader's undying gratitude. He has, on the other hand, presented in a clear and logical manner the conclusions reached through an enormous amount of research and experience. It is a fascinating and instructive volume.

The Application of Absorption Spectra to the Study of Vitamins and Hormones. By R. A. Morton, D.Sc., Ph.D., F.I.C., Department of Chemistry, the University of Liverpool. Cloth. Price, 10s. 6d. Pp. 76, with 31 illustrations. London: Adam Hilger, Ltd. [n. d.]

In this little volume the author presents in an attractive manner the contributions of absorption spectrophotometry to the identification and isolation of vitamins and hormones, with a scant mention of carcinogenic compounds. Vitamins A, B_1, B_2, C, D and E are treated in the space of fifty-eight pages, only three pages being devoted to the hormones. Among the hormones mentioned are the follicular hormone, corporin, thyroxine, insulin and epinephrine. It is pointed out that in the hormone field the scantiness of available data makes it impossible to predict how useful spectrophotometric methods may ultimately be, because the chances for successful application are greatest for ring compounds possessing two or three double bonds and/or carbonyl groups. The value of the spectrophotometric data given by the author is enhanced considerably by the fact that they are presented in correlation with essential chemical and physiologic properties of the compounds in question. In this context the reader is made to feel that spectrophotometric methods constitute a most useful tool for the study of important biologic compounds, while fully recognizing the fact, as pointed out by the author, that for the detection and identification of vitamins and hormones the animal constitutes the court of first and last resort. The publication of this volume is especially timely, as spectrophotometry in biologic research has been a neglected tool. Undoubtedly the scope of its use will be considerably widened by the information now made easily available.

A Geography of Disease: A Preliminary Survey of the Incidence and Distribution of Tropical and Certain Other Diseases. By Earl Baldwin McKinley, M.D., Dean and Professor of Bacteriology, School of Medicine, George Washington University. A study made possible by a grant from The American Leprosy Foundation (formerly The Leonard Wood Memorial) to the division of medical sciences of The National Research Council, Washington, D. C. Published as a supplement to The American Journal of Tropical Medicine. Cloth. Price, $5. Pp. 493. Washington, D. C.: George Washington University Press, 1935.

"In 1929 it suddenly seemed imminent that a philanthropist in America might endow the subject of tropical medicine with a fund estimated at about $40,000,000" reads the introduction. The provocative mirage faded but a book was born, possibly a souvenir of what has been termed the "whoopee era" of medical expansion. It represents a compilation of answers to voluminous questionnaires sent to innumerable health officers in various parts of the world. The project must have given employment to a considerable number of clerks and the compiled results may, in addition, prove useful to public health workers and investigators interested in tropical diseases. It is obviously handicapped by the limitations of the accuracy of the reports that form the basis of the work. Fifteen American states have been included in the morbidity survey; if the material from these is used as a criterion of the usefulness of the data from other countries, that usefulness will probably not be great. It might have been advantageous to provide population statistics for the states selected, because ready comparisons are difficult without them. For the foreign countries surveyed, adequate information of this type has been supplied in the text. Throughout, the effort has been made to provide morbidity statistics. It need not be pointed out that morbidity statistics are misleading in the best regulated countries; in the less advanced regions of the world such tabulations are sheer guesswork. Nevertheless an investigator interested in the tropical diseases of the island of Mauritius, for instance, will immediately have available a 1934 report, from which he can observe that malaria, blackwater fever, dengue fever, leprosy, syphilis, and with them amebic dysentery and typhoid, are prevalent, and so too there is information concerning twenty-five other diseases that are commonly recorded as typically tropical. There are 116 tables of this type, covering practically all countries of the world. Part 5 of the volume consists of short topical summaries contributed by a distinguished group of authors. In these, bacillary dysentery is well presented (considering its uncertainty) and so is brucellosis and dengue fever. Indeed, in every instance an expert in the field of the particular disease has evaluated the results of the survey and has in succinct fashion presented suggestions for further study and research attack. Probably this portion of the book is really of greatest value.

A Text-Book of Medicine for Nurses. By R. Noble Chamberlain, M.D., M.Sc., M.R.C.P., Assistant Physician, Royal Infirmary, Liverpool. With a foreword by Miss E. H. Munson, C.B.E., R.R.C., Chairman, General Nursing Council for England and Wales. Second edition. Cloth. Price, 9/. Pp. 444, with 66 illustrations. New York & London: Oxford University Press, 1935.

This edition has been prepared in order that important advances in medicine, especially in relation to the blood diseases and disorders of the urinary tract, might be included. Sections have also been added which discuss such diseases as undulant fever and coronary thrombosis. The publication of a new British pharmacopeia has also made it necessary for the authors to rewrite the material on therapeutics and to make adjustments in the doses of various drugs. Throughout the book the nursing aspects of treatment are given especial attention. Nurses, as well as all others whose work requires some knowledge of medicine, should find this work of value.

Food for the Diabetic: What to Eat and How to Calculate It with Common Household Measures. By Mary Pascoe Huddleson. With an introduction by William S. McCann, Dewey Professor of Medicine, University of Rochester School of Medicine and Dentistry. Third edition. Cloth. Price, $1.50. Pp. 110, with 2 illustrations. New York: Macmillan Company, 1934.

Mrs. Huddleson's experience as a dietitian and editor of the *Journal of the American Dietetic Association* is reflected in the simple method she uses for teaching. The program given at the beginning of the text outlines a definite schedule, which is the foundation of all diabetic treatment. The importance of the protective foods is emphasized and the diet planned for the child includes four glasses of milk each day. It is refreshing to read the statement "There is little danger of going over the carbohydrate allowance with the use of 5 per cent and 10 per cent vegetables even when these are roughly measured. Complete food tables for use in planning a diabetic diet and a few simple recipes are given. The chapter on the testing of urine for sugar and the explanation of insulin, its action and proper administration is given in a detailed and definite manner and should prove to be of special value.

Post Mortem and Morbid Anatomy. By Theodore Shennan, M.D., F.R.C.S., Professor of Pathology in the University of Aberdeen. Third edition. Cloth. Price, 20/. Pp. 716, with 241 illustrations. Baltimore: William Wood & Company, 1935.

This book is essentially a postmortem manual and as such should be of value to younger pathologists, particularly if they are doing medicolegal work. Details of necropsy technics are carefully described. The principal objections to the book are the price and the poor quality of binding (the reviewer's copy needed rebinding when received). The illustrations are good but are similar to those in regular textbooks of pathology and offer no educational advantages to a pathologist competent to perform necropsies. One wonders whether they do not add unnecessarily to the cost. The purposes of the book are praiseworthy, and the author is to be commended; but the manual can in no way replace a good textbook of pathology and therefore should be marketed in the price range of other dissection manuals.

Miscellany

THE HALL OF MEDICAL SCIENCE AT THE SAN DIEGO EXPOSITION

The Hall of Medical Science is one of the most striking attractions of the California Pacific International Exposition, at San Diego. This building, situated on the main Plaza de Pacifico, is one of the finest and most advantageously located buildings in the exposition. The entire building is devoted to educational exhibits, showing the progress of modern medicine. The California Medical Association, in cooperation with the San Diego County Medical Society, has had complete charge of the project from the finishing and furnishing of the building to the selection, installation and censoring of all exhibits. This is probably the first time that an exposition has devoted all of one of its principal buildings to medical science and given the medical profession a free hand in the development of the exhibits. The exposition has financed the entire expense of the building.

The central and most important feature in the Hall of Medical Science is the exhibit of the American Medical Association, covering about 1,400 square feet. The exhibit features public health problems, periodic examinations and the danger of self diagnosis. A constant projector gives the answers to the most frequent medical questions asked by the public. The display of the activities and publications of the American Medical Association, with its constantly moving figures and brilliant changing illumination, has a unique and intense popular appeal.

The California Medical Association has an equally large exhibit of public health subjects, telling the story of tuberculosis, appendicitis, heart disease, vaccination, diet and medical education.

The progress of modern surgery is told by an operating suite, showing the surgery of 1882 in contrast with the surgery of an approved hospital of today. The operating rooms are complete in every detail, with a surgical staff presented in full sized figures.

An exhibit on maternal welfare by the Pacific Coast Society of Obstetrics and Gynecology is combined with one of the finest exhibits of graded embryos in America, lent by the Department of Embryology of the College of Medical Evangelists. Unique in this group are perfect specimens measuring 3 and 4 mm. and a pair of 3 cm. twins with all membranes intact. The exhibit of the Los Angeles Maternity Service presents three miniature homes showing all the arrangements for delivery and care of the baby in the home. The exhibit tells the story of the care of 21,000 charity patients delivered at home with a maternal mortality of only fourteen patients, and also methods of reducing maternal mortality.

A FEW OF THE MEDICAL EXHIBITS AT THE SAN DIEGO, CALIF., EXPOSITION, FEBRUARY 12 TO SEPTEMBER 9, 1936.

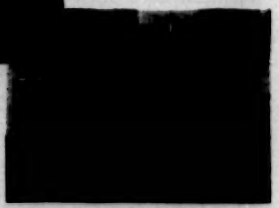
Above
THE HALL OF MEDICAL SCIENCE

Above
EXHIBIT BY THE CHICAGO ROENTGEN SOCIETY AND THE PACIFIC ROENTGEN CLUB

Below
THE EXHIBIT ON MATERNAL WELFARE

Below
EXHIBIT ON PATHOLOGY CONTRIBUTED BY MEDICAL SCHOOLS AND HOSPITALS IN CALIFORNIA

Above
THE AMERICAN MEDICAL ASSOCIATION'S EXHIBIT



The care of the crippled child is demonstrated by exhibits lent by the Los Angeles Orthopedic Foundation, Los Angeles Children's Hospital and San Diego Society for Crippled Children.

An extensive exhibit on human pathology has been assembled from Pasadena Hospital, the College of Medical Evangelists, Los Angeles County Hospital, Stanford University Medical School and University of Southern California Medical School.

The San Diego County Health Department has prepared an exhibit on bacteriology, showing transparencies of photomicrographs of common pathogenic organisms, also growing cultures of bacteria, and demonstrating methods of identifying bacteria.

The California Medical Association is sponsoring exhibits of plastic and reconstructive surgery and also exhibits of bronchoscopy and allergy.

Additional exhibits have been placed by the California Tuberculosis Association, the American Society for Control of Cancer, the Los Angeles Board of Health, the Department of Public

V 106
1936

Health of California, the California State Board of Medical Examiners, the California Dairy Council, the Automobile Club of South California, the General Electric X-Ray Corporation, the Chicago Roentgen Society and Pacific Roentgen Club, the Stanford University Medical School, the University of Southern California College of Dental Surgery, the E. H. Angler Society for Orthodontia and the Pacific Coast Society for Orthodontists.

The Hall of Medical Science has a large auditorium which will be devoted to presentations of moving pictures of public health and medical subjects and to scientific lectures throughout the exposition.

The members of the Woman's Auxiliary of the San Diego County Medical Society has taken over the important task of acting as hostesses in the Hall of Medical Science. They preside over a large and attractive lounge, where visiting physicians and their families will be welcomed and where they may make their headquarters while visiting in San Diego.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Workmen's Compensation Acts: Pneumonia Attributed to Facial Infection.—The workman, in the course of his employment, got a splinter in his cheek, which became infected. Cellulitis developed and hospitalization was necessitated. While at the hospital, the workman had pneumonia. He thereafter sought compensation for wage loss by reason of the pneumonia, attributing that disease to the infection caused by the splinter. The industrial commission awarded compensation, finding that "in view of the nature of the infection, and the sequence and continuity of events, the preponderance of probabilities point to the development of pneumonia because of the bacteria resulting from the facial infection having gained entrance into the blood stream and localized in the lungs." The circuit court affirmed the award and the employer appealed to the Supreme Court of Wisconsin.

Two medical witnesses testified for the workman. One testified that infections of the face have a tendency to get into the blood stream more easily than those of the hand or arm, and that he believed that there was an infection of the blood stream. He consequently thought there was a close association between the infection and the pneumonia. The other witness stated that the facial infection was a streptococcic infection and that pneumonia may result both directly and indirectly from an infection—directly from blood stream transmission, and indirectly by a lowering of the patient's general resistance. He admitted that the connection between the facial infection and the pneumonia in the instant case could not be proved. He testified that it was possible that there was an infection in the blood stream, although there was no demonstrable evidence of that infection, two blood tests having been found negative. On this evidence, said the Supreme Court, there was not only no "preponderance of probabilities" of "development of pneumonia because of bacteria resulting from the facial infection" entering the blood stream, but there was no probability at all. There was nothing more than a possibility, and the industrial commission may not base awards on possibilities. There must be at least some proof of every essential fact to support an award. The award in the present case, the court said, was based on the inferred fact that the facial infection entered the blood stream, and there was absolutely no evidence that it so entered. So far as the award was based on the pneumonia, therefore, the court held that it must be set aside; but, since the workman suffered some wage loss from the facial infection, the case was remanded so that the industrial commission might determine what compensation should be allowed based on the facial infection alone.—*Mayer & Co. v. Industrial Commission (Wis.), 263 N. W. 88.*

Workmen's Compensation Acts: Death from Sunstroke.—Death from exposure to the elements, including the heat of the summer and the cold of the winter, said the Supreme Court of Iowa, is not compensable if the hazard is the same to which the general public is exposed. For compensation to be recoverable for death from sunstroke, the deceased must have been subjected to a greater hazard from heat than that to which the public generally in that locality was subjected. This distinction is recognized by all the authorities. Compensation was denied in this case.—*Wax v. Des Moines Asphalt Paving Corporation (Iowa), 263 N. W. 333.*

Compensation of Physicians: Liability of Third Person for Medical Services.—The plaintiff, a physician, sued the defendant to obtain payment for medical services rendered a Negro employee of the defendant. The Negro, suffering from a gun-shot wound, was taken to a hospital owned and operated by the plaintiff. Immediately thereafter the defendant came to the hospital and, according to the plaintiff, said: "If you will go ahead and take care of the case, I will pay the bill." The testimony of several witnesses tended to corroborate the plaintiff. The defendant, however, denied that he had made the promise just noted and, from a judgment for the plaintiff, he appealed to the Supreme Court of Oklahoma.

The Supreme Court, however, believed that the evidence reasonably tended to support the verdict of the jury. In *May v. Roberts*, 28 Okla. 619, 115 P. 771, relied on by the court in the present case, the plaintiff, a physician, brought suit for services rendered the wife of the defendant's tenant. The defendant had requested the physician to visit the tenant's wife and told him that he would see that the bill was paid. Such evidence was held to be competent and material and to establish a primary liability not within the statute of frauds. Finding no error in the record in the present case, the Supreme Court affirmed the judgment in favor of the physician.—*Gloeckler v. Weedn (Okla.), 50 P. (2d) 634.*

Optometry: Corporate Practice of Optometry Illegal in Arizona; Injunction to Restrain Practice.—The Funk Jewelry Company, a corporation, employed a licensed optometrist to examine eyes and to prescribe glasses. The state of Arizona, on the relation of the attorney general, instituted action to enjoin the corporation from practicing optometry. From an adverse judgment in the trial court, the corporation appealed to the Supreme Court of Arizona.

The optometry practice act, said the court, prescribes certain qualifications to be possessed by applicants for licenses to practice optometry. These qualifications necessarily exclude a corporation from practice. It cannot qualify. It does not possess the necessary moral and intellectual qualities. The corporation, therefore, when it employed a registered optometrist as a part of its business to examine eyes and to prescribe glasses, violated the optometry act. It was apparently contended, however, that even though the corporate practice of optometry was illegal, an injunction would not lie to restrain that practice. The optometry act, observed the court, prescribes no punishment for those who violate its provisions. Consequently, the ordinary criminal sanctions, such as fine and imprisonment, are not available to prevent continued violations of the act. Unless the writ of injunction is available, there is available no remedy to enforce the act. Furthermore, the court continued, while the civil process of injunction may not ordinarily be used to prohibit persons from committing a crime, where the crime is a public nuisance or affects the interests of the state, injunctions will lie. *State v. Smith* (Ariz.), 29 P. (2d) 718, 31 P. (2d) 102, 92 A. L. R. 168. The tendency is to grant injunctions to prevent unlicensed persons from practicing the professions. If the present action, said the court, had been brought by the state board of optometry or by members of the optometry profession, there would be no question of their right to maintain the action, in view of the trend of judicial opinion. The present action, however, was brought by the state, on the relation of the attorney general. The optometry act, continued the court, was

passed for the general welfare of the people of the state. Its purpose is to protect the health of the people, and, while the state may not have any pecuniary interest in the enforcement of the act, it has a very much higher interest, and that is in the protection of the health and well being of its people. That being the case, it seemed to the court that the state, acting through the attorney general, could lawfully apply to the courts to exercise their equity powers to enjoin violations of the act.

The corporation apparently further contended that the state board of optometry had entered into some kind of an agreement with the licensed optometrist whereby the board agreed that the optometrist might render the services for which he was employed for a limited length of time. Such an agreement, the court said, would not have the effect of suspending the requirements of the optometry act. Furthermore, the agreement did not purport to authorize the corporation to practice optometry, and if it had, the agreement would have been void.

The judgment of the trial court, granting the injunction, was therefore affirmed.—*Funk Jewelry Co. v. State ex rel. La Prade (Ariz.), 50 P. (2d) 945.*

Malpractice: Ankylosis of Wrist Following Treatment of Infection.—A nurse, while attending a child afflicted with streptococcic infection of the throat, Nov. 5, 1930, pricked the thumb on her right hand deeply with a pin. Infection of the thumb developed and the defendant, a physician, was consulted. The nurse was removed to a hospital and the hand placed in a hot saline solution to localize the infection, and hot wet compresses were applied. Later, incisions were made and gradual subsidence of swelling and a lowering of the temperature resulted. On November 22 and 23, however, the nurse's hand gave evidence of ankylosis and the defendant applied a banjo splint to put the hand in a position of functioning. A cast was applied around the splint and the forearm. Claiming that a resulting stiffness of her fingers and wrist was due to the defendant's negligent treatment, the nurse brought suit against him. The trial court gave a judgment for the plaintiff, and the defendant appealed to the Supreme Court.

There was a conflict in the evidence, said the Supreme Court, as to whether, in the application of the banjo splint, the defendant retroflexed the hand at an angle of about 90 degrees or at an angle of from 40 to 45 degrees. The plaintiff contended that the defendant had applied to the hand a splint holding the hand in an exaggerated reflexed position, the hand being drawn back at an angle of about 90 degrees, and that the cast was applied around the splint and the forearm so tightly that it interfered with the circulation and with proper drainage. The defendant and the physician who administered the anesthetic prior to the application of the splint testified that the hand was placed in the splint at an angle of from 40 to 45 degrees. Without passing on the evidence, the Supreme Court was compelled to reverse the judgment of the trial court because of the court's refusal to instruct the jury as follows:

> If under the evidence and these instructions you should find in favor of the plaintiff you can only allow her damages for so much of her disability as you believe from the evidence is due solely to the negligence of the defendant, and not for any disability that you may find was due to the infection.

Under the circumstances of the present case, said the court, since the defendant was not responsible or liable for the original injury, but liable only, if at all, for subsequent negligent treatment, those phases should have been carefully separated by instructions in order that the jury might not be allowed to award damages on mere speculation and conjecture.

The hospital record, continued the court, kept in the ordinary course of business was admissible in evidence as an exception to the hearsay rule where the particular entry in question was identified as having been made by a nurse who worked at the hospital and who attended the plaintiff, although the nurse had subsequently left the hospital and her present whereabouts could not be accounted for. An instruction given by the trial court that the jury was not bound by the testimony of expert witnesses was not violative of a constitutional prohibition against judges commenting on the evidence.

For the error committed, the judgment of the trial court was reversed and the cause remanded for a new trial.—*Murgatroyd v. Dudley (Wash.), 50 P. (2d) 1025.*

Society Proceedings

COMING MEETINGS

American Medical Association, Kansas City, Mo., May 11-15. Dr. Olin West, 535 North Dearborn St., Chicago, Secretary.

American Academy of Pediatrics, Kansas City, Mo., May 11-12. Dr. Clifford G. Grulee, 636 Church St., Evanston, Ill., Secretary.

American Association for the Study and Control of Rheumatic Diseases, Kansas City, Mo., May 11. Dr. Loring T. Swaim, 372 Marlboro St., Boston, Secretary.

American Association for the Study of Goiter, Chicago, June 8-10. Dr. W. Blair Mosser, 133 Biddle St., Kane, Pa., Correspondling Secretary.

American Association for Thoracic Surgery, Rochester, Minn., May 4-6. Dr. Richard H. Meade Jr., 2116 Pine St., Philadelphia, Secretary.

American Association of the History of Medicine, Atlantic City, N. J., May 4. Dr. Edward J. G. Beardsley, 1919 Spruce St., Philadelphia, Secretary.

American Association on Mental Deficiency, St. Louis, May 1-4. Dr. Groves B. Smith, Beverly Farms, Godfrey, Ill., Secretary.

American Bronchoscopic Society, Detroit, May 27. Dr. Lyman Richards, 319 Longwood Ave., Boston, Secretary.

American Dermatological Association, Swampscott, Mass., June 4-6. Dr. Fred D. Weidman, Medical Laboratories, University of Pennsylvania, Philadelphia, Secretary.

American Gastro-Enterological Association, Atlantic City, N. J., May 4-5. Dr. Russell S. Boles 1901 Walnut Street, Philadelphia, Secretary.

American Gynecological Society, Absecon, N. J., May 25-27. Dr. Otto H. Schwarz, 630 S. Kingshighway Blvd., St. Louis, Secretary.

American Heart Association, Kansas City, Mo., May 12. Dr. H. M. Marvin, 50 West 50th St., New York, Acting Executive Secretary.

American Laryngological Association, Detroit, May 25-27. Dr. James A. Babbitt, 1912 Spruce St., Philadelphia, Secretary.

American Laryngological, Rhinological and Otological Society, Denver, May 18-20. Dr. C. Stewart Nash, 700 Medical Arts Building, Rochester, N. Y., Acting Secretary.

American Neurological Association, Atlantic City, N. J., June 1-3. Dr. Henry A. Riley, 117 East 72d St., New York, Secretary.

American Ophthalmological Society, Hot Springs, Va., June 1-3. Dr. J. Milton Griscom, 255 South 17th St., Philadelphia, Secretary.

American Orthopedic Association, Milwaukee, May 18-21. Dr. Ralph K. Ghormley, Mayo Clinic, Rochester, Minn., Secretary.

American Otological Society, Detroit, May 28-29. Dr. Thomas J. Harris, 104 E. 40th St., New York, Secretary.

American Pediatric Society, Bolton Landing, N. Y., June 11-13. Dr. Hugh McCulloch, 325 North Euclid Ave., St. Louis, Secretary.

American Proctologic Society, Kansas City, Mo., May 11-12. Dr. Curtice Rosser, Medical Arts Bldg., Dallas, Texas, Secretary.

American Psychiatric Association, St. Louis, May 4-8. Dr. William C. Sandy, State Education Building, Harrisburg, Pa., Secretary.

American Radium Society, Kansas City, Mo., May 11-12. Dr. E. H. Skinner, 1103 Grand Ave., Kansas City, Mo., Secretary.

American Society for Clinical Investigation, Atlantic City, N. J., May 4. Dr. J. M. Hayman Jr., Lakeside Hospital, Cleveland, Secretary.

American Society for the Hard of Hearing, Boston, May 26-30. Miss Betty C. Wright, 1537 35th St. N. W., Washington, D. C., Secretary.

American Society of Clinical Pathologists, Kansas City, Mo., May 6-10. Dr. A. S. Giordano, 531 North Main St., South Bend, Ind., Secretary.

American Surgical Association, Chicago, May 7-9. Dr. Vernon C. David, 59 East Madison Street, Chicago, Secretary.

American Therapeutic Society, Kansas City, Mo., May 8-9. Dr. Oscar B. Hunter, 1835 Eye St. N. W., Washington, D. C.

American Urological Association, Boston, May 18-21. Dr. Clyde L. Deming, 789 Howard Ave., New Haven, Conn., Secretary.

Arkansas Medical Society, Hot Springs National Park, Apr. 27-29. Dr. W. R. Brooksher, 602 Garrison Ave., Fort Smith, Secretary.

Association for the Study of Allergy, Kansas City, Mo., May 11-12. Dr. Warren T. Vaughan, 200 Professional Bldg., Richmond, Va., Secretary.

Association for the Study of Internal Secretions, Kansas City, Mo., May 11-12. Dr. E. Kost Shelton, 34 Michelorena St., Santa Barbara, Calif., Secretary.

Association of American Physicians, Atlantic City, N. J., May 5-6. Dr. Hugh J. Morgan, Vanderbilt University Hospital, Nashville, Tenn., Secretary.

California Medical Association, Coronado, May 25-28. Dr. F. C. Warnshuis, 450 Sutter St., San Francisco, Secretary.

Connecticut State Medical Society, Hartford, May 20-21. Dr. Charles W. Comfort Jr., 27 Elm Street, New Haven, Secretary.

District of Columbia, Medical Society of the, Washington, D. C., May 6. Dr. C. B. Conklin, 1719 M St. N. W., Washington, D. C., Secretary.

Florida Medical Association, S. S. S. Florida, Apr. 27-29. Dr. Shaler Richardson, 111 West Adams St., Jacksonville, Secretary.

Illinois State Medical Society, Springfield, May 19-21. Dr. Harold M. Camp, 302 Lahl Building, Monmouth, Secretary.

Iowa State Medical Society, Des Moines, Apr. 29-May 1. Dr. Robert L. Parker, 3510 Sixth Ave., Des Moines, Secretary.

Louisiana State Medical Society, Lake Charles, Apr. 27-29. Dr. P. T. Talbot, 1430 Tulane Ave., New Orleans, Secretary.

Maryland, Medical and Chirurgical Faculty of, Baltimore, Apr. 28-29. Dr. Walter Dent Wise, 1211 Cathedral St., Baltimore, Secretary.

Massachusetts Medical Society, Springfield, June 8-10. Dr. Alexander S. Begg, 8 The Fenway, Boston, Secretary.

Medical Library Association, Rochester, Minn., May 25-27. Miss Janet Doe, 2 E. 103d St., New York, Secretary.

Medical Women's National Association, Kansas City, Mo., May 10-12. Dr. Lelia A. Conroy-Conner, 333 East 68th St., New York, Secretary.

Minnesota State Medical Association, Rochester, May 3-6. Dr. E. A. Meyerding, 11 West Summit Ave., St. Paul, Secretary.

Mississippi State Medical Association, Greenville, May 5-7. Dr. T. M. Dye, McWilliams Building, Clarksdale, Secretary.

New Hampshire Medical Society, Manchester, May 26-27. Dr. Carleton E. Metcalf, 5 S. State St., Concord, Secretary.

New Jersey, Medical Society of, Atlantic City, June 2-4. Dr. J. B. Morrison, 66 Milford Ave., Newark, Secretary.

New Mexico Medical Society, Carlsbad, May 6-8. Dr. L. B. Cohenour, 219 West Central Ave., Albuquerque, Secretary.

V 106
1936

New York, Medical Society of the State of, New York, Apr. 27-29. Dr. Daniel S. Dougherty, 2 East 103d St., New York, Secretary.
North Carolina, Medical Society of the State of, Asheville, May 4-6. Dr. L. B. McBrayer, Southern Pines, Secretary.
North Dakota State Medical Association, Jamestown, May 17-19. Dr. Albert W. Skelsey, 20½ Broadway, Fargo, Secretary.
Rhode Island Medical Society, Providence, June 3-4. Dr. J. W. Leech, 167 Angell St., Providence, Secretary.
Society for the Study of Asthma and Allied Conditions, Atlantic City, N. J., May 2. Dr. W. C. Spain, 116 East 53d St., New York, Secretary.
Society of Surgeons of New Jersey, Orange, May 13. Dr. Walter B. Mount, 21 Plymouth St., Montclair, Secretary.
South Dakota State Medical Association, Sioux Falls, May 4-6. Dr. John F. D. Cook, Langford, Secretary.
Texas, State Medical Association of, Houston, May 25-28. Dr. Holman Taylor, 1404 W. El Paso St., Fort Worth, Secretary.
West Virginia State Medical Association, Fairmont, June 8-10. Mr. Joe W. Savage, Public Library Bldg., Charleston, Executive Secretary.

Current Medical Literature

AMERICAN

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Titles marked with an asterisk (*) are abstracted below.

Archives of Ophthalmology, Chicago

15: 377-588 (March) 1936

Virus of Inclusion Conjunctivitis: Further Observations. P. Thygeson and W. F. Mengert, Iowa City.—p. 377.
Anatomic Changes After Cyclodialysis. P. C. Kronfeld, Peiping, China.—p. 411.
Measurement of Speed of Adjustment of Eye to Near and Far Vision: Further Study. C. J. Robertson, Annapolis, Md.—p. 423.
Review of Infra-Red Photography, with Reference to Its Value in Ophthalmology. J. B. Feldman, Philadelphia.—p. 435.
Binocular Integration of Hue and Brilliance. G. A. Fry, St. Louis.—p. 443.
*Inflammatory Exophthalmos in Catarrhal Disorders of Accessory Sinuses. M. Cohen, New York.—p. 457.
Minute Structure of Retina in Monkeys and in Apes. S. Polyak, Chicago.—p. 477.

Exophthalmos in Catarrhal Disorders of Sinuses.—Cohen states that in inflammatory exophthalmos the venous circulation plays the important part. The veins, being valveless, permit infection to be carried to and from the orbit. The lesions in the orbit depend on the severity of the sinus infection. During the last three years 1,517 patients with sinusitis have been treated in the wards of the Manhattan Eye, Ear and Throat Hospital. In twenty-two cases the condition was complicated by inflammatory exophthalmos. There were two deaths: one from meningitis and the other from septic thrombosis of the cavernous sinus. Among the twenty-two patients with inflammatory exophthalmos there were eleven with acute ethmoiditis who were treated with medication to the eye and the nasal cavity. The remaining eleven patients were treated by conservative surgery: five by incision and drainage for subperiosteal or orbital abscess, four by external ethmoidectomy with opening of the sphenoid, and two by surgical treatment of the frontal and ethmoid sinuses. The ocular signs of inflammatory exophthalmos are self evident except in the mild acute cases in which the condition is caused by an inflammatory edema of the retrobulbar tissue. In this condition the exophthalmos, the ocular inflammation and the nasal condition are mild and respond rapidly to appropriate treatment. The patient recovers in a few days. The ocular and nasal signs in the more acute and subacute types are more marked and distinctive and are discussed with an illustrative report of a case. Cases of empyema of any of the sinuses, with rupture into the orbit, are recognized by a local swelling with fluctuation over the area involved, which is accompanied by general symptoms, such as pain, headache and increased temperature. Rhinologic and roentgen examination give positive evidence, in addition to swollen nasal mucosa and discharge. The acute symptoms in this type persist for about three or four weeks, after which the ocular signs gradually disappear. In the chronic type the symptoms are similar to those observed in the subacute type, but they are prolonged over a period of eight months or longer. The exophthalmometer is an aid in diagnosing doubtful cases of exophthalmos; this instrument also assists in judging the results of treatment. The treatment in these cases is concerned not only with the ocular condition but also with the sinus disease which is its primary cause. The prognosis is generally favorable in all types of cases, especially if the ocular and general symptoms are not progressive.

Arkansas Medical Society Journal, Fort Smith

33: 149-160 (March) 1936

Ethics. M. E. McCaskill, Little Rock.—p. 149.
Value of Combining County Medical Societies for Scientific Programs. A. M. Gibbs, Hamburg.—p. 151.
Value of Public Relations Committee in the County Medical Society. D. A. Rhinehart, Little Rock.—p. 152.
Arranging the County Society Program. R. B. Robins, Camden.—p. 153.
How the Arkansas Medical Society May Help the County Societies. A. B. Dickey, Prescott.—p. 154.

Johns Hopkins Hospital Bulletin, Baltimore

58: 65-136 (Feb.) 1936

Clinical Observations on Importance of Vestibular Reflexes in Ocular Movements: Effects of Section of One or Both Vestibular Nerves. F. R. Ford and F. B. Walsh, Baltimore.—p. 80.
Clinical Study of Control of Bladder by Central Nervous System. O. R. Langworthy, L. G. Lewis, J. E. Dees and F. H. Hesser, Baltimore.—p. 89.
*Diagnosis of Obscure Fever: I. Diagnosis of Unexplained, Long-Continued, Low Grade Fever. L. Hamman and C. W. Wainwright, Baltimore.—p. 109.

Diagnosis of Obscure Fever.—Hamman and Wainwright divide cases of obscure fever into two groups. The first group comprises cases with low grade fever, the temperature only occasionally exceeding 100 F. and rarely reaching 101 F. The symptoms are not severe and the patients are usually ambulant. The second group comprises cases with higher fever and symptoms that are usually incapacitating. The patients as a rule are confined to bed. Without being able to determine accurately the cause of the fever in any specific case, one may conclude that it must have been due to (1) some mild specific infection: tuberculosis, Malta fever, rheumatism; (2) some focus of septic infection: tonsillitis, appendicitis, pyelitis or uncertain causes about which instruction is meager: metabolic disorders, neurogenic fever. Of the uncertain causes it may be said that there can be little doubt that hysterical manifestations may be accompanied by fever. In psychotic patients, whether agitated or depressed, a little fever is almost regularly observed in spite of the fact that careful examination reveals no cause for its occurrence other than the abnormal mental state. Psychiatrists have often commented on variations in the temperature of psychoneurotic patients regularly recurring in relation to psychiatric treatment and mental trauma. That obscure clinical condition called effort syndrome, exhaustion syndrome, disordered action of the heart or neurocirculatory asthenia is nearly always accompanied by slight fever. Finally, some few persons may have a thermoregulatory mechanism set at a high level and for them a temperature between 99 and 100 F. may be normal. Even though the physician may be convinced that such anomalies do sometimes occur, he is never justified in making this diagnosis under any concrete circumstances.

Journal of Comparative Neurology, Philadelphia

63: 173-368 (Feb. 15) 1936

First Neurofibrillar Development in Albino Rat Embryos. W. F. Windle and R. E. Baxter, Chicago.—p. 173.
Development of Reflex Mechanisms in Spinal Cord of Albino Rat Embryos: Correlations Between Structure and Function, and Comparisons with Cat and Chick. W. F. Windle and R. E. Baxter, Chicago.—p. 189.
Reaction of Bladder to Stimulation of Points in Forebrain and Midbrain. H. Kabat, H. W. Magoun and S. W. Ranson, Chicago.—p. 211.
Effect of Lesions in Central Nervous System of Rat on Reflex Time. R. Y. Herren, L. E. Travis and D. R. Lindsley, Iowa City.—p. 241.
Development and Morphology of Cerebellum in Opossum: Part II. Later Development and Adult. O. Larsell, Portland, Ore.—p. 251.
Conduction Pathways in Cerebral Peduncle of Amblystoma. C. J. Herrick, Chicago.—p. 293.
Pupilloconstrictor Area in Cerebral Cortex of Cat and Its Relationship to Pretectal Area. R. W. Barris, Chicago.—p. 353.

Journal of Immunology, Baltimore

30: 109-212 (Feb.) 1936

Serologic Comparison of Phosphoprotein of Serum of Laying Hen and Vitellin of Egg Yolk. R. R. Roepke and L. D. Bushnell, Manhattan, Kan.—p. 109.
Studies on Tetanus Toxoid: I. Antitoxic Titer of Human Subjects Following Immunization with Tetanus Toxoid and Tetanus Alum Precipitated Toxoid. F. G. Jones and J. M. Moss, Indianapolis.—p. 115.
Comparisons of Various Methods for Routine Titration of Types I and II Antipneumococcus Horse Serums. L. A. Barnes, Charlotte M. Clarke and Eleanor C. Wight, Boston.—p. 127.
Effect of Gonadotropic and Estrogenic Hormones on Agglutinin Response to Bacillus Pertussis in Immature Animals. J. H. Dingle, R. K. Meyer and E. L. Gustus, Kalamazoo, Mich.—p. 139.
Development of Foreign Protein Sensitization in Human Beings. J. R. Mote and T. D. Jones, Boston.—p. 149.
Mass Factor in Immunologic Studies on Viruses. M. H. Merrill, Princeton, N. J.—p. 169.
Quantitative Studies on Neutralization of Equine Encephalomyelitis Virus by Immune Serum: I. Combination of Virus and Antibody in Vitro. M. H. Merrill, Princeton, N. J.—p. 185.
Id.: II. The "Percentage Law." M. H. Merrill, Princeton, N. J.—p. 193.
Study of Virulence of Meningococcus Strains and of Protective Activity of Antimeningococcus Serums. Sophia M. Cohen, Albany, N. Y.—p. 203.

Journal of Thoracic Surgery, St. Louis

5: 225-336 (Feb.) 1936

*Pleuropulmonary Complications of Amebiasis: Analysis of One Hundred and Fifty-Three Collected and Fifteen Personal Cases. A. Ochsner, New Orleans, and M. DeBakey, Lake Charles, La.—p. 225.
Bronchography Following Thoracoplasty for Tuberculosis. H. L. Cabitt, J. J. Singer and E. A. Graham, St. Louis.—p. 259.
*Surgical Revision of Unsatisfactory Thoracoplasty by Reoperation and Extraperiosteal (Subscapular) Packing. T. J. Kinsella, Oak Terrace, Minn.—p. 267.
Resection of Medial Portion of Scapula for Relief of Pain and Disability Following Thoracoplasty: Report of Case. C. R. Steinke and J. T. Vilsoni, Akron, Ohio.—p. 286.
*Roentgen Study of Mode of Development of Encapsulated Interlobar Effusions. L. G. Rigler, Minneapolis.—p. 295.
Observations on Effect of Hyperventilation on Vital Capacity of Surgical Patients, with Some Remarks on Effect of Postoperative Complications and Influence of Abdominal Binders and Adhesive Strapping. J. H. Powers, Cooperstown, N. Y.—p. 306.
Aseptic Anemic Infarct of Lung with Sequestration: Case Report. I. A. Bigger and G. D. Vermilya, Richmond, Va.—p. 315.
Maggot and Allantoin Therapy in Tuberculous and Nontuberculous Suppurative Lesions of Lung and Pleura: Report of Eight Cases. N. Bethune, Montreal.—p. 322.

Pleuropulmonary Complications of Amebiasis.—Ochsner and DeBakey state that pleuropulmonary complications of amebiasis occurred in 15.8 per cent of 2,490 reported and in 15.7 per cent of their ninety-five consecutive cases of amebic hepatic abscess. Men are involved much more frequently than women. Such complications occur, as a rule, from an extension of amebic hepatic abscess. Perforation of the abscess occurs rarely into the free pleural space but more frequently into the lung or bronchus. Exceptionally hematogenic pulmonary amebic abscesses may occur. Pleuropulmonary amebic infections are classified into five groups, depending on the type of pleuropulmonary involvement: (1) hematogenic pulmonary abscess without liver involvement, (2) hematogenic pulmonary abscess and independent liver abscess, (3) pulmonary abscess extending from liver abscess, (4) bronchohepatic fistula with little pulmonary involvement, and (5) empyema extending from liver abscess. The clinical manifestations of pleuropulmonary amebiasis consist chiefly of cough and expectoration, fever, diarrhea, enlarged and tender liver, pain in the chest and cachexia. Cough and expectoration were observed in 92.5 per cent of the collected cases, fever in 43.2 per cent, a history of a previous diarrhea was obtained in 41 per cent, an enlarged liver present in 39.7 per cent, diarrhea at the time of admission in 33.5 per cent, and pain in the chest in 31.3 per cent. The expectoration of chocolate sauce pus is indicative of a communication between a liver abscess and a bronchus and is of diagnostic importance. Pulmonary manifestations consist of consolidation and cavitation. There is a moderate leukocytosis without concomitant increase in the polymorphonuclear leukocytes; marked leukocytosis is indicative of a secondary infection. Roentgen examination shows elevation and fixation of the diaphragm and a shadow at the right base, particularly in those cases in which a pulmonary abscess extends from a liver abscess. The shadow is triangular with the base below and the apex above. Diagnosis can be established by the characteristic chocolate sauce pus and the finding of amebas in the sputum and aspirated material. The prognosis in pleuropulmonary amebiasis is dependent on the type of the lesion and the therapy employed. The mortality rate in the collected series was extremely high (41.1 per cent). The treatment of pleuropulmonary amebiasis consists of the administration of emetine and the aspiration of those abscesses not sufficiently evacuated through the bronchus. Open drainage should never be done except in cases in which there is secondary infection. The incidence of recovery in cases treated without emetine in the collected cases was 43.9 per cent and in the authors' cases 40 per cent, whereas in cases in which emetine was administered the respective incidences were 91.8 and 100 per cent.

Surgical Revision of Unsatisfactory Thoracoplasty.—Kinsella obtained improved results in a number of patients who were subjected to reoperation whose thoracoplasties have proved unsatisfactory. When combined with some form of extraperiosteal (subscapular) packing the results have apparently been more certain, although the procedure is somewhat more formidable. The results to date justify a more extensive use of this procedure. The application of some type of subscapular pressure at the time of primary operation would seem advisable in certain selected cases and may obviate the necessity for reoperation later.

Roentgen Study of Encapsulated Interlobar Effusions.—Rigler presents roentgen observations of cases of pleural effusion, of cases of pneumonia and one detailed report of a case in which there was an encapsulated interlobar empyema in order to demonstrate that: 1. Free pleural effusions may extend into the interlobar fissures, particularly in the horizontal positions. 2. Roentgenologically these extensions may simulate encapsulations. 3. Encysted interlobar effusions may develop as a result of such an extension if adhesions form during the course of the effusion. 4. This may be the common mechanism for the development of the interlobar encapsulations which complicate pneumonia.

Laryngoscope, St. Louis

46: 85-168 (Feb.) 1936

Can Certain Diseases of Ear, Nose and Throat, Especially Degeneration of Eighth Nerve, Be Classified as "Deficiency Diseases?" G. Selfridge, San Francisco.—p. 85.
Bacteriophage Therapy in Nasal and Aural Diseases. S. L. Rushia, New York.—p. 107.
Thyroxine in Treatment of Otosclerosis: Preliminary Report. M. A. Goldstein, St. Louis.—p. 112.
Auditory Function Studies in an Unselected Group of Pupils at the Clarke School for the Deaf: II. Classification According to Type and Level of Graphy by Air Conduction. Ruth P. Guilder and Louise A. Hopkins, Northampton, Mass.—p. 120.
Neoplasm of Antrum. E. L. Berger and M. D. Berger, Brooklyn.—p. 137.
New Retractor for Caldwell-Luc Operation. A. M. Alden, St. Louis.—p. 153.

Military Surgeon, Washington, D. C.

78: 161-240 (March) 1936

Importance of Preventive Medicine from Standpoint of Medical Officer of the United States Army. H. S. Cumming.—p. 161.
The Late King of Great Britain and the First American Army Contingent to Reach Europe in the World War. H. L. Gilchrist.—p. 168.
Yaws on the Island of Guam. C. S. Butler.—p. 174.
Some Remarks About Blood Pressure. J. C. Carballeira.—p. 183.
Scarlet Fever: Its Management and Prevention in the CCC. H. F. de Fee.—p. 187.
Tularemia in Rocky Mountain Sector of Western Front: Fort Douglas CCC District. T. W. Burnett.—p. 193.
General Hospital. L. E. Hetrick.—p. 199.
The Veterinary Corps: Its Origin, Functions and Importance. O. E. McKim.—p. 204.
*Treatment of Acute Colds with Bacteriophage: Lysed Bacterial Antigen. O. B. Schreuder.—p. 211.

Treatment of Acute Colds with Bacteriophage.—In 1933 Schreuder gave bacteriophage-lysed bacterial antigen subcutaneously in dosages of 0.4, 0.7 and 1 cc. on three successive days to 169 patients with symptoms limited to the nose and upper part of the pharynx who had the cold less than forty-eight hours. Sixty-six patients were definitely improved, sixty-five were slightly benefited and thirty-eight experienced no relief. In view of these results it was decided to treat the common infections of the respiratory tract in the winter of 1934-1935 by the same means and to run a control by giving inoculations with sterile physiologic solution of sodium chloride.

V 106
1936

No other treatment was given except general advice as before. Of twenty-nine cases treated by injections of bacteriophage-lysed bacterial antigen ten were definitely benefited, nine slightly benefited and ten unimproved. Of the thirty-one patients given injections of physiologic solution of sodium chloride sixteen were definitely relieved, ten experienced slight benefit and five had no relief. The conclusion is that subcutaneous injections of bacteriophage-lysed bacterial antigen is of no benefit in the treatment of acute colds.

Nebraska State Medical Journal, Lincoln

92:81-120 (March) 1936

The American and European Cancer Control Problem. A. Soiland, Los Angeles.—p. 81.
Paroxysmal Hypertension. A. Sachs and B. C. Russum, Omaha.—p. 84.
Value of Electrocardiogram: Review of Five Hundred Records. O. A. Reinhard, Lincoln.—p. 87.
*Common Errors in Diagnosis and Treatment of the Psychoneurotic Patient: Study of One Hundred Case Histories. A. E. Bennett and E. V. Semrad, Omaha.—p. 90.
Pneumonia in Children. F. S. Clarke, Omaha.—p. 93.
Traumatic Cerebral Edema in a Child of Six Months, with Associated Skull Fracture. F. L. Wilson and R. L. Gorrell, Stuart.—p. 95.
Diagnosis and Treatment of Anemia. III. Pernicious Anemia. J. C. Sharpe, Omaha.—p. 98.

Diagnosis and Treatment of the Psychoneurotic Patient.—Bennett and Semrad found that seventy-two of 100 psychoneurotic patients were admitted with erroneous diagnoses of some severe organic disease. In twenty-nine instances serious organic gastro-intestinal disease was diagnosed yet did not exist. In fourteen cases endocrine diagnoses were made, usually of toxic hyperthyroidism when anxiety hysteria was the disabling disorder. Fifteen patients were admitted as suffering from serious organic cerebral disease. Other diagnoses of serious organic trouble referable to almost all the bodily systems were made erroneously. These mistakes in diagnosis come largely from lack of a general understanding of the principles of psychopathology, failure to elicit an adequate history and to consider situational and psychogenic factors, and failure to appreciate the importance of the personality makeup of the patient. In evaluating symptoms many physicians overlook the emotional setting out of which the physical sensations develop in the neurotic patient. Ill advised therapeutic procedures were very common in the group; 179 surgical operations had been performed on seventy-three patients, at least half of which were probably unnecessary. Adequate psychogenic and personality factors to account for the etiology were found in all cases. At least half of the patients had marital, domestic or sex conflicts. Hypersensitive and introvertive constitutional traits were frequent. Economic conflicts and hereditary factors accounted for the remainder. After psychotherapeutic procedures 70 per cent of the patients were definitely improved. More adequate training in the principles of psychobiology and psychopathology are necessary for the general physician to understand the psychoneurotic patient. Psychotherapy is the logical approach and offers the only scientific method of relief for this large group of maladjusted personalities.

New England Journal of Medicine, Boston

214:341-400 (Feb. 20) 1936

Endometriosis, with Particular Reference to Conservative Treatment. R. B. Cattell and N. W. Swinton, Boston.—p. 341.
*Hutchinson-Boeck's Disease (Generalized "Sarcoidosis"): Historical Note and Report of Case with Apparent Cure. F. T. Hunter, Boston.—p. 346.
Foot Statics and Surgery. F. J. Cotton, Boston.—p. 353.
Effect of Coramine on Postpartum Patients Under Analgesic Influence of Some Barbituric Acid Drugs. A. A. Levi, Boston, and C. M. Krinsky, Newark, N. J.—p. 362.
The Personality of the Physician. J. H. Pratt, Boston.—p. 364.
Abdominal Compression and Vaginal Tamponade in Treatment of Abruptio Placentae. R. J. Heffernan, Boston.—p. 370.
Inversion of Uterus in Two Consecutive Pregnancies: Case Report. R. E. Stewart, Boston.—p. 373.

Hutchinson-Boeck's Disease.—The evidence from previously reported cases and from the case cited by Hunter is that Hutchinson-Boeck's sarcoid is a systemic disease. It affects at times not only the skin but the lymph glands—both peripheral and those at the hilus of the lungs—the spleen, the parenchyma of the lungs, the phalanges of the fingers and toes, the mucous membranes, the conjunctivae and the parotid gland. In its power of invading many organs, it simulates lymphoblastoma. Iritis is not infrequently a precursor or accompanies the skin lesions. One of the probable reasons why it has been overlooked so long by the internist is the multiple and formidable nomenclature given it by dermatologists and others. The case presented showed changes limited to the skin and reticulo-endothelial system—lymph nodes and spleen; for, although Kissmeyer doubts the involvement of the spleen in many of the reported cases, the fact that under treatment this patient showed a decrease of the splenic enlargement which paralleled the regression of the lymphadenopathy cannot, in the author's judgment, be dismissed as fortuitous. It seems logical, therefore, to assume that the spleen would have shown the same morbid histology as that demonstrated in the biopsy of a lymph node, typically sarcoid. This malady offers a possible solution to another problem, that of the true diagnosis in instances in which apparently healthy patients, without skin lesions, give evidence of increased hilus shadows accompanied by diffuse infiltration of the lungs at roentgen examination, an appearance not infrequently reported by roentgenologists as tuberculosis. More careful roentgen and clinical observation may in the future determine whether these patients are suffering from Hutchinson-Boeck's "sarcoid."

New Jersey Medical Society Journal, Trenton

33:65-126 (Feb.) 1936

Clinical Manifestations of Early Childhood Tuberculosis. S. B. English and M. Gross, Glen Gardner.—p. 71.
Pathology of Childhood Tuberculosis. C. R. Brown, Arlington.—p. 77.
Institutional Treatment of the Epileptic Child. B. S. Baker, Skillman.—p. 78.
Effect of Urban Conditions on Temperament of the Child. J. S. Plant, Newark.—p. 83.
*Endocrinology and the Convulsive State. A. W. Pigott, Skillman.—p. 86.
Addison's Disease: Report of Case. J. M. Coppoletta, Cliffside Park, and W. J. Monaghan, Laurel Hill.—p. 90.

Endocrinology and Convulsive Conditions.—Pigott is of the opinion that in a certain proportion of convulsive conditions there is a possible relationship between some endocrinopathy and the convulsions. There are too many epileptic patients coming into institutions showing gross evidence of dysfunction of the glands of internal secretion to disregard them entirely as an etiologic or a concomitant factor; and the fact that substitution therapy has failed to relieve the attacks in most of these cases is not sufficient evidence for one to ignore the endocrines, but rather a reflection on one's ability to determine which gland or glands are at fault and the inadequacy of the preparations used in the treatment. However, the author hesitates to make a positive claim to a specific connection between the endocrines and convulsions, especially epileptic convulsions, and he bases his deductions almost entirely on clinical observation with little or no experimental data to substantiate them. He discusses each of the endocrine glands separately. In addition to a consideration of each of the endocrines as a separate unit, there are numerous interrelationships that probably play a part in the production of convulsive seizures, and, as Turner has pointed out, the rather frequent occurrence of physiologic and morbid changes in the endocrines in cases of epilepsy gives an indication of the relationship of these glands to this condition and one is readily able to suppose that convulsive crises may be lessened by a normal physiologic balance and aggravated by an abnormal balance.

West Virginia Medical Journal, Charleston

32:101-148 (March) 1936

Urinary Calculi: Their Experimental Production and Solution with Clinical Application. C. C. Higgins, Cleveland.—p. 101.
Nephralgia: Symptomatology, Diagnosis and Treatment. A. E. Goldstein, Baltimore.—p. 107.
Significance of Cardiac Arrhythmias. W. C. Stewart, Charleston.—p. 113.
Ancient Egyptian Mummification and Its Effect on Medicine, Pathology and Therapeutics. J. K. Cooper, Premier.—p. 117.
Treatment of Recent Wounds. W. M. Junkin, Elkins.—p. 122.
Leukorrhea Due to Trichomonas Vaginalis. A. P. Hudgins, Charleston.—p. 127.
Treatment of Pellegrini-Stieda Syndrome: Report of Two Cases. E. B. Henson, Charleston.—p. 132.
Clean Milk and How to Get It. D. B. Lepper, Bluefield.—p. 135.
Purpura Fulminans: Report of Case. G. M. Harsha, Sistersville.—p. 137.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Anæsthesia, Manchester

13:41-88 (Jan.) 1936

*Anesthesia: Its Present and Future. W. S. Sykes.—p. 41.
Investigations into Urea Nitrogen Content of Blood Following Anesthesia. Eileen A. Boyd, introduction by R. Jarman.—p. 56.
Combined Evipan-Novocain Anesthesia. G. Bathelf.—p. 66.

Anæsthesia.—Sykes points out that it is possible to reduce postoperative mortality below the 4 to 5 per cent average. Certain minimal essentials are required to create a satisfactory service. 1. Resident anesthetists should be appointed at all large hospitals without exception. 2. No person should be appointed as visiting anesthetist without previous experience as resident, thus bringing anesthesia into line with all other branches of medicine and surgery. 3. Anesthetic clerkships should be compulsory for the better instruction of students. 4. It should be an absolute rule that no dresser be allowed to give an anesthetic except under direct supervision. 5. Patients in private wards should invariably get what they pay for—the personal care of an experienced anesthetist. Under no circumstances should the same fee be payable to a senior member of the staff and to a newly qualified house surgeon. 6. The equipment of many hospitals requires a drastic overhauling. Good modern gas machines should always be available. 7. These machines, though robust, are not fool proof. Therefore, no one except people familiar with their construction and mechanism should be allowed to use them or they will never be in working order, nor will satisfactory anesthesia be obtained. Financial considerations in the form of repair bills may thus do what the interests of the patient have failed to do; that is, protect patients against the dangers of unskilled and unsupervised anesthesia. 8. As the science of anesthesia is constantly changing and constantly advancing in common with the rest of medicine and surgery, provision should be made so that suggestions for reforms and improvements may be brought to the notice of the governing body without loss of time.

East African Medical Journal, Nairobi

12:297-324 (Jan.) 1936

Loose Stools, with Particular Reference to Amebiasis. H. C. Trowell.—p. 299.
Value of Serum in Treatment of Cerebrospinal Fever. R. P. Cormack.—p. 311.

Journal of Tropical Medicine and Hygiene, London

39:1-12 (Jan. 1) 1936

Vitamin A Prophylaxis in Epidemic Meningococcic Meningitis. N. L. Corbill.—p. 1.
*Yeastlike Fungi in Sputums of Tuberculous Patients. S. H. Ying.—p. 4.

39:13-24 (Jan. 15) 1936

Contribution to the Knowledge of Lymphogranulomatosis Venerea as a General Disease. W. E. Coutts.—p. 13.
Resurvey of Hookworm Disease in Fiji in 1935, Ten Years After Mass Treatment. S. M. Lambert.—p. 19.

Yeastlike Fungi in Sputums of Tuberculous Patients.—Ying examined the sputums of 100 patients with pulmonary tuberculosis and twenty normal subjects. The patients are instructed to brush their teeth and to wash their oral cavities with Dobell's solution. A few minutes afterward the sputums expectorated are collected in different sterilized receptacles and are immediately washed with 70 per cent alcohol for five minutes and with physiologic solution of sodium chloride for a few minutes and then cultured on Sabouraud's medium and 8 per cent dextrose agar respectively. Of the 100 specimens, nine showed positive cultures, and in the twenty healthy individuals there was one positive culture. In the positive cultures tiny, creamy colonies were noticed on the second to the fourth day. The author classifies the ten yeastlike organisms on the bases both of morphology and of their biochemical characteristics. Basing the classification on the morphologic characteristics according to Langeron, he classifies his strains as Candida, Mycocandida, Mycotorula and Mycotoruloid. Basing the classification on their biochemical characteristics, after Castellani, they are classified as Monilia bronchitica Castellani, Monilia pinoyi Castellani, Monilia krusei Castellani, Monilia tropicalis Castellani and Monilia (cryptococcus) macroglossae Castellani. Animal inoculation shows that these monilias obtained from the sputums of the tuberculous patients are more pathogenic. From his study the author is of the opinion that the presence of yeastlike fungi in the lung is possible without giving rise to symptoms or signs. Or it may be that these symptoms are so slight that they do not attract the attention of the patient, and at the same time the signs are so slight that they cannot be detected clinically.

Medical Journal of Australia, Sydney

1:41-72 (Jan. 11) 1936

Surgical Sequels of Acute Cerebral Trauma. G. Phillips.—p. 41.
Sequels of Head Injuries. C. G. McDonald.—p. 45.
*Acute Upper Abdominal Pain. J. C. Storey.—p. 52.

Acute Upper Abdominal Pain.—Storey divides true abdominal pain of the upper part of the abdomen into three classes: (1) the colic due to the spasmodic contraction of a hollow viscus or duct during its attempt to expel anything acting as an obstruction, (2) the continuous pain of tension in similar organs and (3) pain due to irritation of the peritoneum. The worst pain of the upper part of the abdomen is probably associated with acute hemorrhagic pancreatitis, and no less unbearable is that of perforation of a duodenal ulcer. Gallstone colic can be almost as bad. When one is called to a patient who is overwhelmed with pain in the upper part of the abdomen, action should be prompt, for delay may mean death. The signs, symptoms and treatment of gallstone colic, cholecystitis, acute pancreatitis and perforation of duodenal ulcer as heralded by pain in the upper part of the abdomen are discussed. A leaking or ruptured hydatid cyst must be considered in all patients with acute pain of the upper part of the abdomen. Coronary thrombosis is a fashionable diagnosis, and, while it is bad enough to mistake this condition for a perforation, the reverse error is worse. Spasm of the celiac vessels can be mistaken for a surgical emergency. The author has seen a patient with tetanus admitted to the hospital with a diagnosis of an abdominal crisis. Renal colic is sometimes projected forward, but as a rule no confusion need arise. Perforation of a gastric carcinoma is rare, as is the bursting of the gallbladder. Malaria may mimic any disease. Acute appendicitis is the most common cause by far of all abdominal emergencies, and the initial pain is often high, so that it may be difficult to exclude the old favorite.

Practitioner, London

136:121-236 (Feb.) 1936

Carcinoma of Colon. C. Gordon-Watson.—p. 121.
Treatment of Colitis. S. W. Patterson.—p. 136.
Pruritus Ani. W. J. O'Donovan.—p. 148.
Colostomy and Its Management. W. B. Gabriel.—p. 159.
Hemorrhoids. C. N. Morgan.—p. 172.
Fistula in Ano. O. V. Lloyd-Davies.—p. 186.
Rickets. J. C. Spence.—p. 196.
Early Diagnosis of Infantile Paralysis and Its Treatment. J. M. Smellie.—p. 203.
Treatment of Osteo-Arthritis of Hip: Note. G. Slot.—p. 212.
Favorite Prescriptions: XIV. Pharmacopeia of Westminster Hospital. S. Woodwark and J. Mindline.—p. 214.

Journal of Oriental Medicine, Dairen, South Manchuria

23:85-114 (Dec.) 1935

Radiography of Vas Deferens (Ampulla) and Seminal Vesicles. H. Yanagihara and T. Miyata.—p. 85.
Sweat Reflexes Due to Changes in Posture of Human Body. K. Ogata and T. Ichihashi.—p. 95.
Functional Variations in Human Sweat Glands, with Remarks on Regional Difference of Amount of Sweat. K. Ogata.—p. 98.
Hydrogen Ion Concentration Within Histiocytes: Storing and Phagocytic Functions: Part II. Phagocytosis or Storing of Fats and Lipoids. S. Hatano, S. Iwata, T. Mori, S. Nanba, H. Takemotsu, M. Arai, S. Baba, T. Goto, S. Yasutake and S. Hamamoto.—p. 102.
Effect of Ultraviolet Irradiation on Wassermann Reaction and Aschheim-Zondek Pregnancy Reaction. M. Murayama.—p. 103.
Statistical Results of Treatment of Various Dermatoses with Patient's Own Blood Which Has Been Subjected to Ultraviolet Irradiation. M. Murayama.—p. 104.
Metabolism in Endemic Goiter of Jehol, Digestion and Resorption of "Hakumai," Japanese Grain. U. Tahei.—p. 105.
Metabolism in Endemic Goiter of Jehol, Digestion and Resorption of Sorghum Millet. U. Tahei.—p. 108.
Tubercle in Healthy School Children. T. Ota.—p. 109.
Studies on Trichomonas Vaginalis Donné: V. Vital Staining of Trichomonas Vaginalis. K. Matsuda.—p. 109.
Catalase of Dysentery Bacilli. S. Fukuda.—p. 110.
Primary Lymphogranuloma of Stomach. M. Imai.—p. 113.

V 106
1936

Revue Franc. de Gynec. et d'Obst., Paris

80: 1003-1070 (Dec.) 1935

*Treatment of Functional Disorders of Menstruation by Weak Doses of Roentgen Rays Applied to Ovaries and Hypophysis. W. Wittenbourg and J. Porkhovnik.—p. 1003.
Postclimacteric Hemorrhages and Their Relation to Malignant Neoplasms. W. Wittenbourg and A. Zlatmann.—p. 1026.
Urinary Tract Diseases as Indication for Sterilization of Women. B. Zlatmann.—p. 1054.

Menstrual Disorders Treated by Roentgen Rays.—Wittenbourg and Porkhovnik report observations on 117 young women with functional menstrual disturbances treated by roentgen rays. All seemed to be connected with the ovarian function but presented considerable variation in symptoms. Sometimes the difficulty was in the length of the cycle, sometimes hypomenstruation or hypermenstruation, and sometimes a combination of the two. The cyclic disorders or their combination with hypomenstruation respond best to roentgen therapy. Amenorrheas are more refractory. The prognosis as to complete cure is less favorable when the patient is older. It becomes especially uncertain when the patients presenting amenorrhea are more than 30 years of age. The more hypoplastic the uterus, the less is the chance for a good effect. In some cases (about 15 or 18 per cent) the sterility that had accompanied the menstrual disorders also disappeared. The author concludes that this method of treatment of menstrual disorders of functional nature in young women should be practiced only by an experienced roentgenologist in conjunction with a capable gynecologist.

Policlinico, Rome

48: 227-282 (Feb. 10) 1936. Practical Section

*Arteriography of Thoracic Aorta by Puncture of the Ascending Aorta or the Left Ventricle. I. Nuvoli.—p. 227.
Celiac Disease: Case. E. Mondolfo.—p. 237.
Combined Treatment with Ethylchaulmoogra and Ethylmorrhuate Preparations in Diseases of Respiratory Tract. F. Falasca.—p. 245.

Arteriography of Thoracic Aorta.—Nuvoli performed arteriography of the thoracic aorta as a means of diagnosis in two cases of aneurysm by introducing the contrast medium into the ascending aorta in one case and into the left ventricle in the other. The puncture of the ascending aorta and the injection of 28 cc. of a 100 per cent solution of sodium iodide, given at a constant pressure of 1,800 Kg. during the injection, did not produce complications in the first case, while in the second the puncture of the left ventricle and the injection of the same amount of the solution, given at a constant pressure of 2,200 Kg., produced a syncope of brief duration followed by bradycardia (56) which lasted for thirty-six hours. The author believes that the syncope was due to the sudden distention of the myocardium and increased intraventricular pressure caused by the injection. He concludes that, while arteriography of the thoracic aorta by puncture of the ascending aorta is justified, puncture of the left ventricle should not be performed, unless a substance giving satisfactory x-ray shadows without producing increase of the intraventricular pressure can be discovered.

Prensa Médica Argentina, Buenos Aires

22: 419-480 (Feb. 12) 1936

Bronchography in Asthma and Chronic Bronchitis. N. Romano, R. Eyherabide and R. Tarradellas.—p. 419.
*Atrophy of Hemidiaphragm Following Phrenicectomy. J. C. Galan, G. Fonseca and J. Dutrey.—p. 427.
*Failure in Tubal Sterilization. A. G. Peralta Ramos.—p. 430.
Mesosystolic and Protomesosystolic Murmurs in Infarct of the Apex: Necropsic Confirmation of Diagnosis in a Case. R. Lorenzo and D. Boto.—p. 435.
Amino-Acids in Treatment of Gastroduodenal Ulcers. V. Mastronardi and F. Bagnasco.—p. 443.
Fracture of Larynx: Case. A. Bercovich.—p. 456.

Atrophy of Diaphragm Following Phrenicectomy.—Galan and his collaborators state that the results of experiments and necropsies prove that a well performed phrenicectomy with ample resection of the phrenic nerve results in the production of atrophy of the muscles of the corresponding hemidiaphragm. The anatomopathologic study performed by the authors in two cases in which the paralysis of the diaphragm had lasted for three years and a half and for eight months showed that the hemidiaphragm corresponding to the phrenicectomized side had undergone the following changes: intense atrophy of the muscle, a large part of which had disappeared and had been replaced by cellulofatty tissues, and intense alterations of the remaining muscular fibers, a large portion of which were dissociated and thinned. The authors state that the anatomopathologic changes of the hemidiaphragm after phrenicectomy prove that the phrenic nerve is the one which controls movement of the diaphragm and that, if there is any collateral motor innervation due to the presence of intercostal, either contralateral or accessory phrenic nerves, and other nervous impulses, it is insufficient to maintain the trophic conditions of the diaphragm after phrenicectomy and still more insufficient to maintain the motor functions of the diaphragm after the same operation.

Failure in Tubal Sterilization.—Peralta Ramos states that all the methods used for permanent sterilization of women may prove inefficient in preventing pregnancy. The tubes may regain their functions by a partial reopening or by replacing themselves in the abdominal cavity after operations, such as simple ligation of the tubes, ligation followed by section, partial or complete tubal resection, peritonization of tubal stumps, transposition of the tubes or the combined methods of these operations. Total removal of both tubes followed by performance of a cuneiform excision of the fundus of the uterus and by a double seroserous and musculomuscular suture is the operation that offers the best chance of preventing pregnancy, but even this is relative.

Beiträge zur Klinik der Tuberkulose, Berlin

87: 423-518 (Feb. 20) 1936

*Displacental Transmission of Tuberculosis. F. Lucksch.—p. 423.
*Atelectasis. H. W. Knipping.—p. 448.
Estimation of Pulmonary Blood Perfusion. H. W. Knipping.—p. 465.
Disseminated Acute Tuberculous Panangiitis. F. Orsós.—p. 488.
Development of Corpora Amylacea in Lung. F. Orsós.—p. 500.
Study of Tuberculous Giant Cavities. J. L. Garcia y Garcia-Midon.—p. 509.

Displacental Transmission of Tuberculosis.—Lucksch maintains that congenital tuberculosis is comparatively rare. The most frequent kind of transmission through the mother is by way of the placenta. However, there seems to be a disproportion between the incidence of placental tuberculosis and of congenital tuberculosis, and it seems difficult to understand why a tuberculosis of the placenta should remain without influence on the fetus. This problem and the frequent reports about filtrable forms of the tubercle bacillus induced the author to make further studies on the problem of congenital tuberculosis. He made histologic and animal experiments on placental materials, animal experiments with the blood of umbilical cords, and cultural and animal studies on the organs of fetuses. He frequently detected changes in the placenta and decidua which, although they appeared nonspecific and did not present the typical aspects of tuberculosis, nevertheless were proved to be of a tuberculous nature in the animal test. Bacterioscopic studies and animal experiments on the blood of umbilical cords and on the fetal organisms revealed the presence of filtrable forms of the tuberculosis virus. The author believes that the tuberculosis virus has become mitigated in recent times, pointing out that filtrable forms of the virus, nonspecific tissue changes and mitigation of the causal organism mutually explain and support one another. It appears that infection as well as immunization of the fetus is much less frequent by the blood stream (by way of the placenta) than is the case after birth by the respiratory or digestive tracts or by the parenteral route.

Atelectasis.—Knipping stresses that in this report he discusses only the type of atelectasis that develops in case of closure of the air passages. He disregards entirely compression atelectasis and atelectasis of the new-born. In case of acute atelectasis of larger parts of the lung, the clinical aspects are usually pain on the diseased side, particularly under the sternum, acceleration of the pulse and normal or elevated temperature. There is more dyspnea than cyanosis. The diseased side drags and seems smaller than the normal one. The intercostal spaces are retracted, the heart is displaced toward the diseased side and the diaphragm stands higher than normal. The respiratory sounds are reduced over the diseased part of the lung and there may be moist and sonorous râles. The percussion sound is shortened. Exudate and spontaneous pneumothorax can usually be ruled out. The shadow of the diseased

part of the lung is unusually homogeneous and readily differentiated from pneumonic and other infiltrates. However, in the majority of cases it is impossible to demonstrate the closure of the pertaining bronchus. Preceding pulmonary hemorrhage suggests a stenosing clot. But the occlusion may be caused also by syphilitic changes of the bronchial wall, bronchial calculi, bronchial edema, foreign bodies, aneurysms, swelling of the hilus glands and bronchial tumors. After discussing these various forms of atelectasis, the author gives his attention to the small atelectases and to the forms of atelectasis that develop in tuberculosis. As an accompanying symptom of tuberculosis, atelectasis may be a favorable factor. He discusses the therapeutic use of artificial bronchial closure and atelectasis. He suggests that it might be used in cavities that do not yield to pneumothorax therapy. To be sure, the artificial closure of the bronchus should not be irreparable.

Strahlentherapie, Berlin

58: 193-368 (Feb. 26) 1936. Partial Index

*Desensitization of Mucous Membrane in Protracted Fractional Roentgen Irradiation. R. Glauner.—p. 195.
Action of Roentgen Rays on Hereditary Substance. H. J. Muller.—p. 207.
Epilation of Head by Roentgen Rays. A. Preppe.—p. 225.
*Late Effects of Epilation Irradiations in Regard to Mental Development of Child. T. Symann.—p. 248.
Results of Modified Prolonged Irradiation of Exophthalmic Goiter. W. Böhme and H. Kühl.—p. 262.
Roentgen Therapy, Hypertrophy and Focal Infection of Lymphatic Ring of Pharynx. R. Torres-Carreras and P. Bosch Sola.—p. 279.

Desensitization of Mucous Membrane in Fractional Roentgen Irradiation.—Glauner points out that in the course of protracted fractional roentgen irradiations, particularly in case of malignant tumors of the oral cavity, of the pharynx and of the larynx, there frequently develop reactions in the mucous membrane, which Coutard has called radiation epithelitis. In order to reduce this epithelitis, the author sought to achieve a reduction in sensitivity by reduction of the blood perfusion of the tissues by means of painting with an epinephrine solution of 1:1,000. The anemia thus produced persists for from thirty to forty minutes or even for one hour; that is, for the duration of the irradiation. In order to demonstrate definitely that the epithelitis could be reduced, the author applied the epinephrine solution only to one side. He reports eight cases of oral carcinoma in which he resorted to the one-sided epinephrinization. In five of these cases the epithelitis was completely suppressed on the side that had been treated with epinephrine; in two other cases it was considerably less severe on the treated side; the remaining case cannot be estimated in this connection, since epithelitis did not develop on the treated or on the untreated side.

Late Effects of Epilation Irradiations.—Symann reports the results of examination of fifty-three patients who had been subjected to roentgen epilation during the years from 1917 to 1926 on account of fungus diseases (favus, microsporia) of the head. He points out that in recent years the question has been discussed whether roentgen epilation or thallium epilation is better. This induced him to investigate whether roentgen epilation produces permanent impairments. He found that in four of the patients the hair had become denser after the irradiation, while in eight others it had become less dense. In one case a roentgen lesion was noticeable in the form of atrophy of the skin and bone. The author assumes that the dosage had been incorrect in this case. Eight patients stated that their hair had become darker after the epilation, but in two others the opposite was the case. In fourteen patients the hair had become curly, but the curliness disappeared again in from twelve to eighteen months. One patient, who had undergone roentgen epilation at the age of 2 years and 10 months, has complained since that time of frequent headaches and attacks of vertigo. The author thinks that the brain may have been impaired in this case, owing to the greater ray sensitivity of the infantile brain. Intelligence tests revealed slight or severe mental deficiency in eighteen patients. However, no definite proof could be furnished that these subnormal intelligences were the result of the roentgen epilation, for in a number of cases the siblings of the patients also were of subnormal intelligence, others had had difficulties with their school work even before the roentgen epilation, and in still others repeated infectious diseases make it appear possible that an encephalitis is responsible for the mental deficiency. Nevertheless there remain several cases of mental deficiency in which roentgen impairment seems possible.

Zentralblatt für Gynäkologie, Leipzig

60: 369-432 (Feb. 15) 1936. Partial Index

*Action of Estrogenic Substance on Blood Pressure. E. Steinkamm and W. Giesen.—p. 370.
Titration of Estrin and Gonadotropic Hormone in Urine. K. Pedersen-Bhergaard.—p. 372.
Gonadotropic Hormone from Urine of Pregnancy. M. Ito, S. Hajasu and F. Ueno.—p. 375.
Influence of Pregnancy Urine on Surviving Rabbit Uterus. K. Fukushima and H. Kameda.—p. 378.

Action of Estrogenic Substance on Blood Pressure.—Steinkamm and Giesen point out that Liebhart observed in normal, menopausal and castrated women and in those with hypofunction of the ovaries that the injection of estrogenic substance was followed by a reduction in the blood pressure. To determine whether this reduction in blood pressure was really the result of estrogenic substance, the authors made tests on thirty-five women belonging to the same groups as those examined by Liebhart. They observed that the intravenous injection of 200 mouse units of estrogenic substance resulted in a decrease in blood pressure, which in menopausal women reached as high as 25 mm. of mercury. Since, at least in menopausal women, the blood pressure is unstable, the authors questioned the justification of ascribing the reduction in blood pressure to the action of estrogenic substance. They repeated the experiments with phy·iologic solution of sodium chloride and found that the blood sugar curve was influenced in the same manner as had been the case after the injection of estrogenic substance. They conclude that as yet it has not been proved that estrogenic substance reduces the blood pressure.

Nederlandsch Tijdschrift voor Geneeskunde, Haarlem

80: 1087-1174 (March 14) 1936

Exotic Diseases in Holland: II. Juxta-Articular Nodules. H. B. G. Breijer, E. M. Elsbach and E. H. Hermans.—p. 1101.
Diagnostic Difficulties in Bronchography. E. Huizinga.—p. 1106.
Latent Cases of Epidemic (Lethargic) Encephalitis Resembling Neurasthenia. M. Weersma.—p. 1113.
*Influence of Endocrine Organs on Genesis of Epilepsy. J. J. H. M. Klessens.—p. 1119.

Influence of Endocrine Organs on Epilepsy.—From a curve indicating the initial ages at which epilepsy appeared in 750 men and 750 women, Klessens draws the following conclusions: Genuine epilepsy most frequently begins at prepuberty, but even in the presence of brain lesions the onset of the attacks may be between 10 and 12 years. The onset of epilepsy is causally related to the processes that lead to sexual maturity, which is shown by the observation that the brisk elevation of the curve indicating this maximal onset shows the same age difference between boys and girls that is shown by sexual maturing itself. After complete sexual maturity has been established, the onset of epilepsy becomes much rarer: in boys after the fifteenth and in girls after the eighteenth year. This difference in the lowering of the curves between the sexes is based on delayed pubescence, which, as is the case with lasting incomplete maturity, is found in women more often than in men. The course of the curve in man as well as in woman, no matter how great the difference may be, supports the assumption that the mature gonad checks the irritability of the brain cells or at least originates other processes which promote cerebral response. As the most essential feature of epilepsy is the great lability of various functions, it is obvious that during the period of development epilepsy more often begins in women than in men, 44 per cent of the female cases beginning between 10 and 18 as against 33 per cent in the male. In opposition to the greater vulnerability of women during the period of sexual development, males are found to be more vulnerable in the early years of life, showing 26 per cent of cases of epilepsy beginning during this period, while only 20 per cent develop in women; similarly, in adult life epilepsy more often sets in in men (14 per cent) than in women (10.5 per cent).

V 106
1936